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Aug. 6, 1990 • #72
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—*George Hara, DEFTA/Data Control Ltd.*

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Venture Capitalist Survey
Case History: Autodesk Meets The Venture Capitalist
Alternative Funding Sources For Entrepreneurs

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SEE PAGE 39

DVORAK ON LOOK AND FEEL

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SEE PAGE 218

HURRY! REBATES END AUGUST 31

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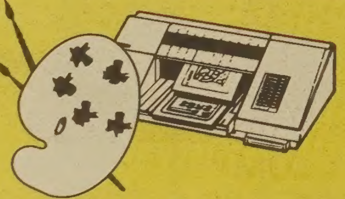

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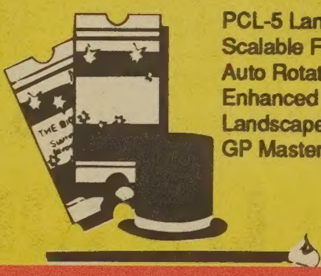

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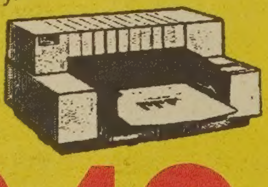

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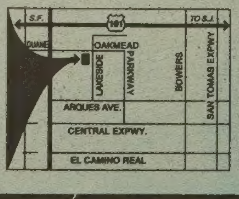

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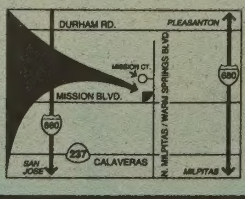

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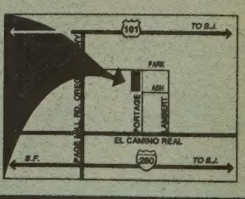

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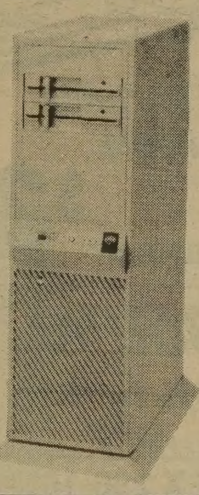

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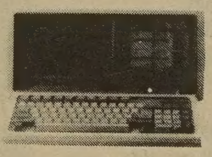

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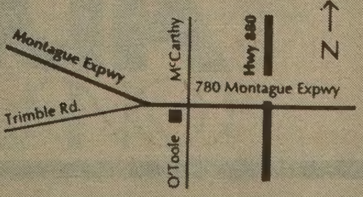

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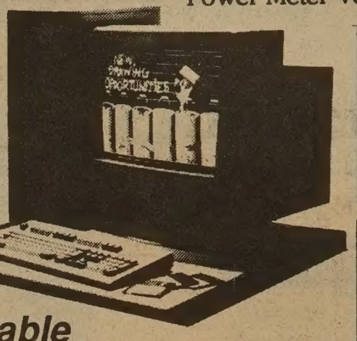

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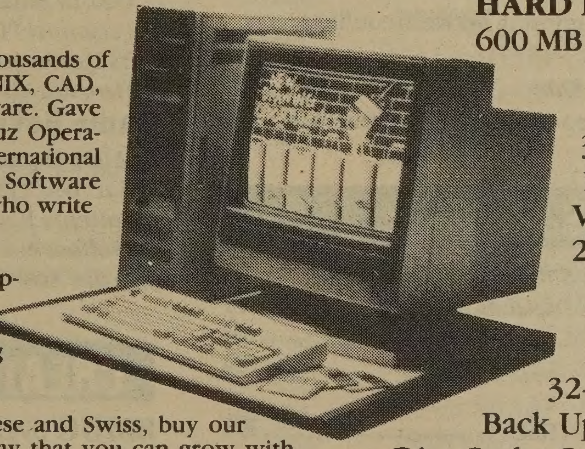

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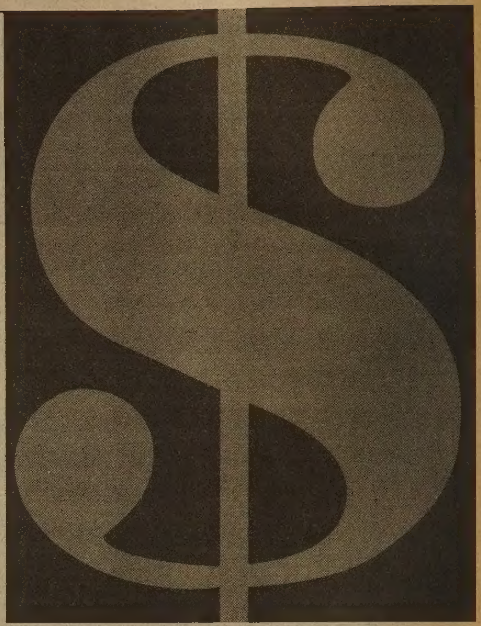
A NOTE FROM THE EDITORS:

In order to deal with the challenges of an ever-different marketplace and the uncertainties of the next decade, the VC community is also changing and adjusting, reevaluating the most effective ways of helping fledgling companies and entrepreneurs with good ideas succeed and bring rewards to their investors.

We've interviewed two young venture capitalists. George Hara, whose investments include the likes of SCO, Borland, and Wollongong, is working to implement his idea of the multinational high-tech startup, particularly in the US/Japan marketplace. Ann Winblad, herself a successful software entrepreneur, is now a partner in a new venture firm which funds software companies exclusively.

We've also interviewed some leading venture capitalists about the trends they're seeing in the industry, and discovered some useful alternative sources for information and funding.

And finally, we revisit the historic moment when the resolutely independent Autodesk considered the idea of venture capital.



COVER STORY

Venture Capital In A New Decade 46

By Mary Eisenhart **Cover photos: Michael Jay**

For our venture capital profile this year, we feature two young Bay Area venture capitalists who specialize in adding value to companies in particular niches. Ann Winblad is a partner in a brand-new firm, Hummer Winblad, which invests exclusively in software companies. George Hara has been involved in US-Japan high tech for years and works to help US companies set up joint ventures in international marketplaces.

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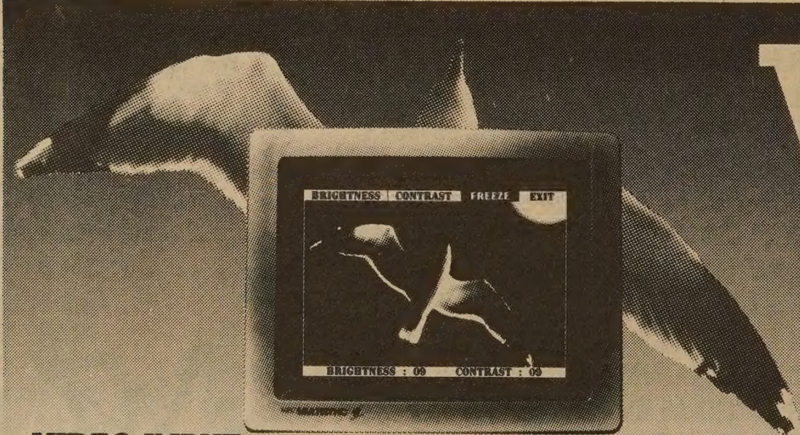

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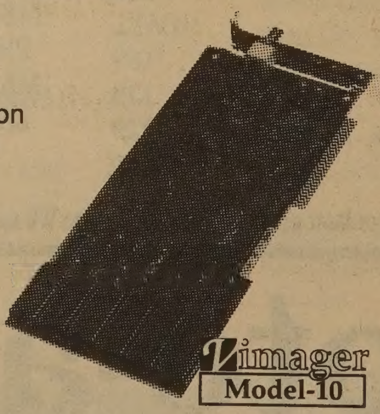

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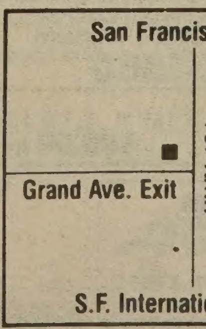

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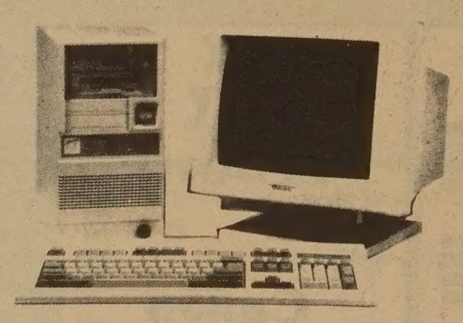

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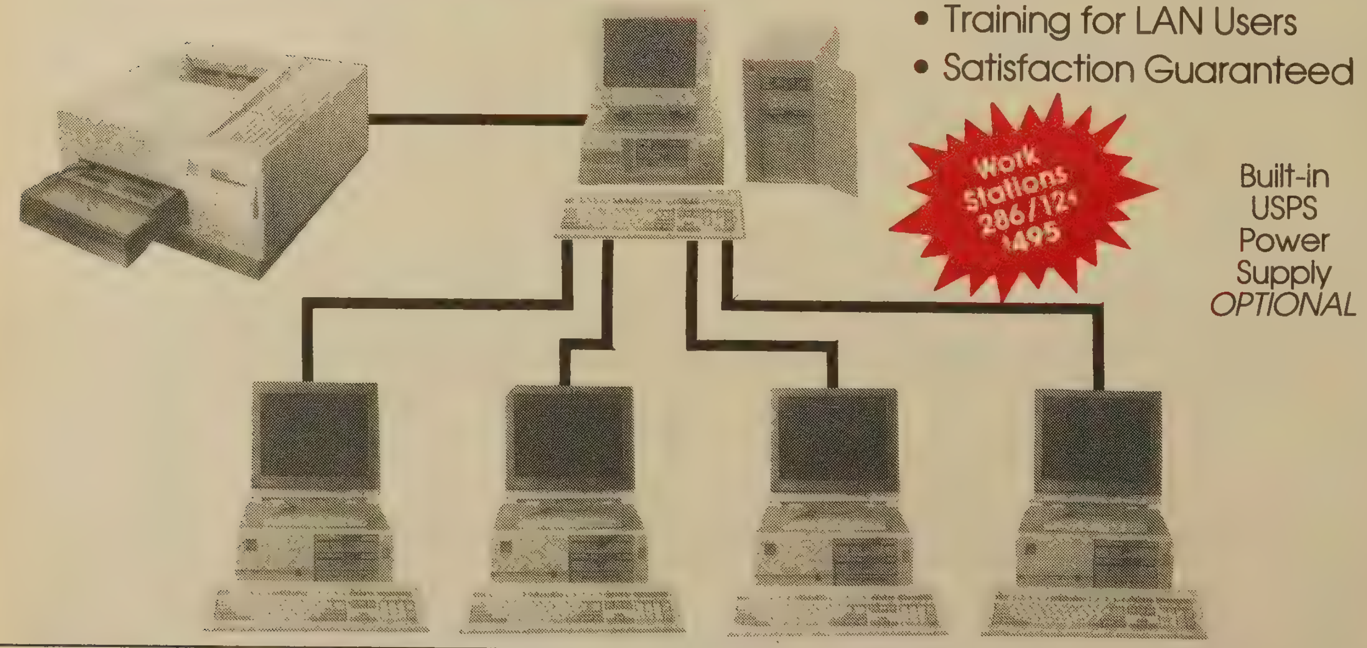

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BY PAUL HOFFMAN

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on USENET (phoffman @well) and MCI Mail (264-3171). He also writes popular microcomputer books.

LOTUS WINS LOOK-AND-FEEL CASE, SUES BORLAND AND SANTA CRUZ OPERATION

Following a trend of court decisions supporting the concept that a program's interface is copyrightable, US District Judge Robert E. Keeton ruled that Paperback Software's VP-Planner infringed on Lotus 1-2-3's copyright by having the same command sequence and display. The ruling, which will be appealed by Paperback, gave software companies more guidance in what can and cannot be copied when making programs that compete with established software. Lotus hailed the ruling as "a significant milestone," while other software publishers worried that it opened them up to a spate of costly litigation.

A few days after winning the case, Lotus sued Borland International and the Santa Cruz Operation (SCO) for copyright infringement, citing Judge Keeton's ruling. Although SCO Professional is clearly similar in interface to 1-2-3, Borland's Quattro Pro is only similar in one mode, and even then does not need to be if the user does not want it to be. By suing Borland, Lotus seems to be saying that any program that comes with an interface that can be considered infringing automatically infringes, even if the user has many choices for other interfaces.

The judge's ruling simply decided that Lotus did indeed own the copyright on the structure, sequence, and organization of the menus.

Lotus has also asked that VP-Planner be removed from the market and that Paperback be forced to pay millions of dollars. Those parts of the case will be decided later.

Judge Keeton appeared to understand a great deal about computer technology. Many of the introductory pages of his 110-page ruling defined computer jargon as he intended to use it in his ruling and showed that he agreed with most standard usages. He went on to show that he was following a fair amount of precedent in deciding that more than the instructions that make up a program could be copyrighted. For example, the Copyright Office announced that computer screens could be copyrighted and, in fact, were copyrighted at the time that the copyright application for the program was filed.

> **By suing Borland, Lotus seems to be saying that any program that comes with an interface that can be considered infringing automatically infringes, even if the user has many choices for other interfaces.**

Much of the decision follows previous federal cases in which judges ruled that the user interface is as worthy of copyright protection as the software itself. Keeton stated that he believed testimony from expert witnesses that "the bulk of the creative work is in the conceptualization of a computer program, in its user interface rather than in its encoding, and that creating a suitable user interface is a more difficult intellectual task, requiring greater creativity, originality, and insight, than converting the user interface design into the instructions of the machine." Since Congress uses the copyright laws to foster people receiving benefit from their creative work, Judge Keeton felt that they would have wanted this type of creativity rewarded by copyright protection.

The response to the ruling varied widely. Although it was pretty much the same as similar cases in the last few years, many people said it would cause many more lawsuits and thus hurt the computer industry. That was borne out the week after the ruling when Lotus sued one of its major rivals in the spreadsheet market, Borland, based on the results of the case. Some lawyers thought that this was premature, since Judge Keeton had the option of levying minor or no damages for the infringement. The case against Borland is also tricky, since the 1-2-3-like interface that comes with Quattro is one of three that the

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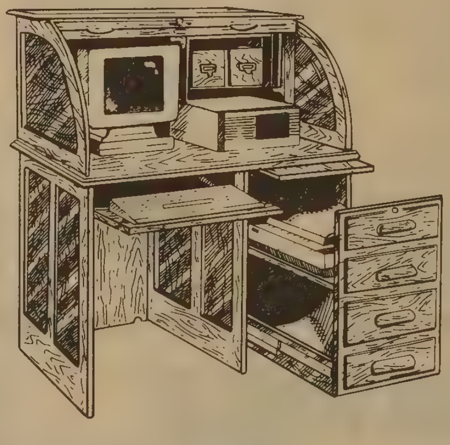

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user can choose from. It is not the "suggested" interface or even the most desirable one. By suing Borland, Lotus is saying that any program that can emulate a copyrighted user interface is by nature infringing.

Interestingly, Judge Keeton both acknowledged the long public debate on the subject and, at the same time, rejected it. "Despite its widespread use in public discourse on the copyrightability of nonliteral elements of computer programs, I have not found the 'look and feel' concept, standing alone, to be significantly helpful in distinguishing between nonliteral elements of a computer program that are copyrightable and those that are not." He said that look and feel was more useful for comparing two works than for determining whether one deserves a copyright.

> "Despite its widespread use in public discourse on the copyrightability of nonliteral elements of computer programs, I have not found the 'look and feel' concept, standing alone, to be significantly helpful in distinguishing between nonliteral elements of a computer program that are copyrightable and those that are not.
>
> —Judge Keeton

Where many people disagree with Judge Keeton is in his ruling that Lotus's use of some of the user interface mechanics means that Lotus should receive a copyright. Keeton said, "The idea for a two-line moving cursor menu is also functional and obvious, and, indeed, is used in a wide variety of computer programs including spreadsheet programs. Nevertheless, it does not follow that every possible method of designing a menu system that in-

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cludes a two-line moving cursor is non-copyrightable." People criticizing Keeton said that if the structure of the menu is functional and obvious, both of those features should make the menu non-copyrightable.

Instead, Judge Keeton said, "I conclude that a menu command structure is capable of being expressed in many if not an unlimited number of ways, and that the command structure of 1-2-3 is an original and nonobvious way of expressing a command structure. Accordingly, the menu structure, taken as a whole—including the choice of command terms, the structure and order of those terms, their presentation on the screen, and the long prompts—is an aspect of 1-2-3 that is not present in every expression of an electronic spreadsheet." To many, this seems to contradict what he said earlier.

Of course, once the decision that 1-2-3's user interface can be copyrighted is made, there is no doubt that VP-Planner infringed on the copyright. The defendants at Paperback Software admitted to copying the interface in order to make it easier for their users to learn the software. There were some differences, but Judge Keeton felt that, "From the perspective of both an expert and an ordinary viewer, the similarities overwhelm differences." He continued, "Moreover, even if some elements of VP-Planner were very different, it would not give defendants a license to copy other substantial elements of 1-2-3 verbatim."

The last part of his ruling specifically criticized the concept that he should rule against Lotus for the benefit of the greater software development community. "Policy arguments advanced without focusing on whether they are inconsistent with the mandates of legislation—along with strained analogies and word games—are fundamentally flawed because they do not take account of limitations on the role of courts, to which counsel as well as courts are obliged to be sensitive. Courts must enforce the mandates of legislation, and even when answering questions of law not answered by those mandates, must do so in a way that respects legislative policy choices, whether explicit or implicit."

He also claimed that his ruling would not stifle creativity: "The metaphorical 'shoulders of giants' on which successors may legally stand

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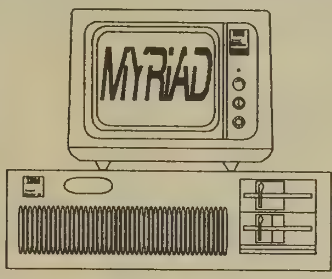

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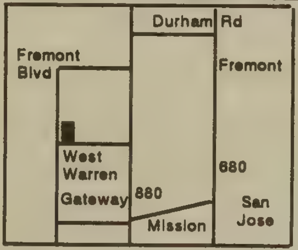

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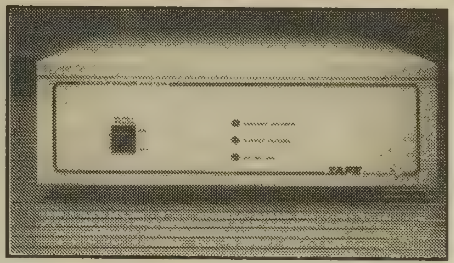

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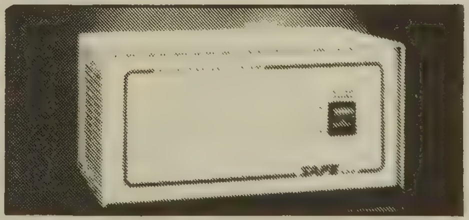

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are not as broad as defendants contend. The legally relevant shoulders of programming giants are their ideas—and do not extend to all of their expressions. The encouragement of innovation requires no more. It is sufficient that programmers are privileged to borrow and improve upon previous ideas—such as the ideas for an electronic spreadsheet and a two-line moving cursor menu. Adequate room for innovation remains even though successors are barred from copying earlier authors' particular expressions such as the particular structure, sequence, and organization of a menu command system."

So the argument continues. It is now clear, from this case and many cases before it, that the courts feel that the user interface (or, at least some part of the user interface) is copyrightable. All decisions have gone to great lengths to state that only the non-obvious parts are copyrightable, but this will probably lead to a war of experts saying what is and is not obvious in a user interface. For example, the steady growth of the Macintosh and Microsoft's concomitant emulation of the Mac interface have made much of the user community think that things like closable windows, pull-down menus, mouse pointers, and so on are obvious. Ten years ago, they were considered just plain silly. These rulings indicate that you can only copyright parts of a user interface once a judge would not find them obvious.

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The major source of doubt is that IBM failed miserably in its last attempt at the home market. The PC/jr ("Peanut") was a poorly-crafted, expensive, slow system that was eventually withdrawn, stranding the tens of thousands of users who had bought it. Most people bought the PC/jr because it said "IBM" on the front, not because it had any technical strengths. The PS/1 may be doomed to the same fate.

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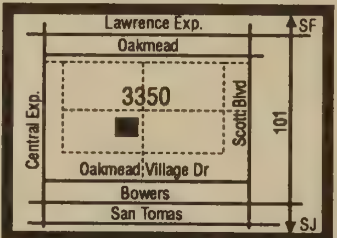

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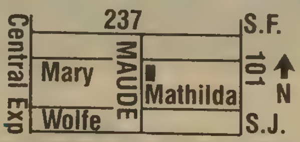

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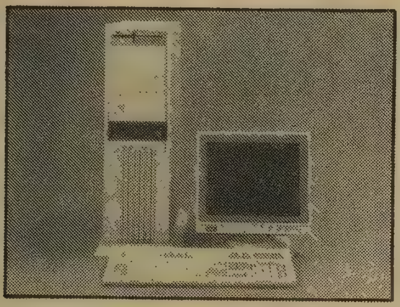

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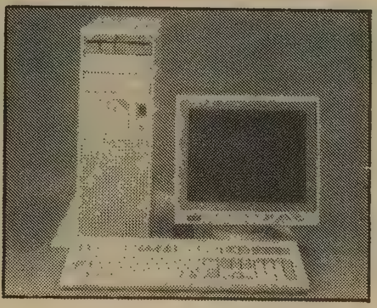

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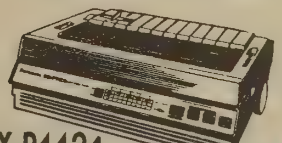

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VGA monochrome display, a built-in 2400 baud modem, a mouse, and 512K (not even 640K) of RAM. There are no expansion slots, but cards can be added through plugs on the system. MS-DOS 4.01 comes in ROM. The price for that system is $1000. A color display adds $450 to the price. No, you can't buy someone else's display. IBM put the power supply for both the computer and the display in the display, so you are forced to buy a PS/1 display when you upgrade.

Many industry observers noted that $1000 is way too much for most families to spend on a computer. In addition, a similarly configured clone system with expansion slots can be bought from many *MicroTimes* advertisers for around $725. Competing non-PC systems can be found for around $500.

The PS/1s come with a fair amount of free software, probably enough to keep most home-office users happy (as long as they don't want to play games). Each system comes with Microsoft Works 2 and software for connecting to the Prodigy network.

Since IBM was more than willing to drop support for the PC/jr when it was clear that there wasn't much market for it, many buyers are worried that IBM will do the same for the PS/1.

Since buyers will be able to run other MS-DOS software (well, non-Windows and non-OS/2 software), the systems should not limit the buyers too much. The hard disk systems (with 1Mb of RAM) cost about $600 more than the floppy-only systems.

Given the slow CPU and limited expandability, no one is concerned that IBM is cannibalizing the PS/2 line. Instead, they are concerned that people who know much about PCs will scoff at the PS/1 as underpowered and not able to grow in the future. Since IBM was more than willing to drop support for

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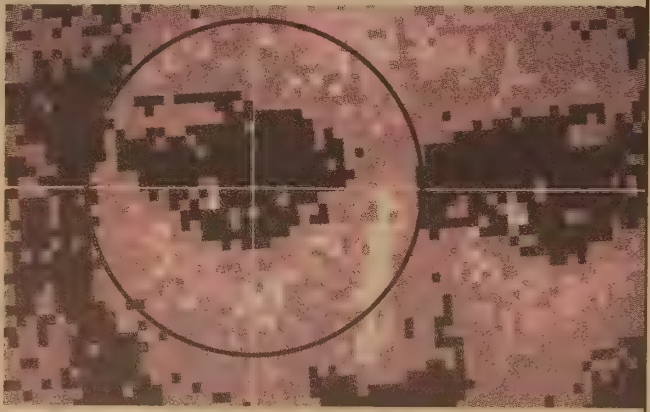

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LANDMARK = 21
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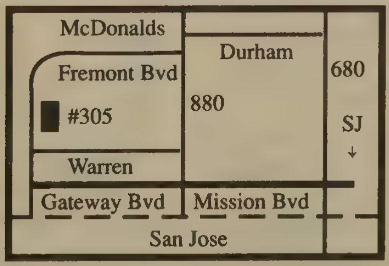

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the PC/jr when it was clear that there wasn't much market for it, many buyers are worried that IBM will do the same for the PS/1.

DOS 5, WINDOWS 3

Microsoft announced that they will ship MS-DOS version 5 by the end of this year. There are not many changes in the new version, but it should help most users, since it uses less of the first 640K of memory than current MS-DOS. PCs with extended memory will be able to put much of the system code in higher memory. People who run MS-DOS programs under Windows 3 on 80386 systems will get much more memory under DOS 5. Microsoft indicated that there will be many user interface improvements as well.

> **Since its introduction, Windows 3 has been selling briskly. Although the setup procedure for Windows 3 is significantly better than for Windows 2, Microsoft has been inundated with calls, causing significant delays in responding.**

Since its introduction, Windows 3 has been selling briskly. Hundreds of thousands of people who are interested in the environment have either upgraded or bought new packages. Although the setup procedure for Windows 3 is significantly better than for Windows 2, Microsoft has been inundated with calls, causing significant delays in responding. They have set up two new telephone lines to handle the increased call loads: (206)637-7098 for Windows 3 and (206)637-7099 for Windows applications. The numbers have non-human call attendants during off hours to answer the most common Windows questions for people with touch-tone phones. ■

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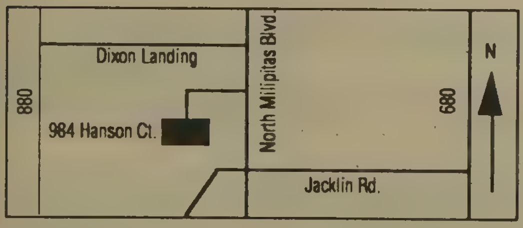

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Across The Electronic Frontier

BY MITCHELL KAPOR AND JOHN PERRY BARLOW

GUEST EDITORIAL

Over the last fifty years, the people of the developed world have begun to cross into a landscape unlike any which humanity has experienced before. It is a region without physical shape or form. It exists, like a standing wave, in the vast web of our electronic communication systems. It consists of electron states, microwaves, magnetic fields, light pulses and thought itself.

It is familiar to most people as the "place" in which a long-distance telephone conversation is held. But it is also the repository for all digital or electronically transferred information, and, as such, it is the venue for most of what is now commerce, industry, and broad-scale human interaction. William Gibson called this Platonic realm "Cyberspace," a name which has some currency among its present inhabitants.

Whatever it is eventually called, it is the homeland of the Information Age, the place where the future is destined to dwell.

CYBERSPACE

In its present condition, Cyberspace is a frontier region, populated by the few hardy technologists who can tolerate the austerity of its savage computer interfaces, incompatible communications protocols, proprietary barricades, cultural and legal ambiguities, and general lack of useful maps or metaphors.

Certainly, the old concepts of property, expression, identity, movement, and context, based as they are on physical manifestations, do not apply succinctly in a world where there can be none.

Sovereignty over this new world is also not well defined. Large institutions already lay claim to large fiefdoms, but most of the actual natives are solitary and independent, sometimes to the point of sociopathy. It is, therefore, a perfect breeding ground for both outlaws and vigilantes.

Most of society has chosen to ignore the existence of this arising domain. Every day millions of people use ATMs and credit cards, place telephone calls, make travel reservations, and access information of limitless variety—all without any perception of the digital machinations behind these transactions.

Our financial, legal, and even physical lives are increasingly dependent on realities of which we have only the dimmest awareness. We have entrusted the basic functions of modern existence to institutions we cannot name, using tools we've never heard of and could not operate if we had.

As communications and data technology continues to change and develop at a pace many times that of society, the inevitable conflicts have begun to occur on the border between Cyberspace and the physical world.

These are taking a wide variety of forms, including (but hardly limited to) the following.

I. LEGAL AND CONSTITUTIONAL QUESTIONS

What is free speech and what is merely data? What is a free press without paper and ink? What is a "place" in a world without tangible dimensions? How does one protect property which has no physical form and can be infinitely and easily reproduced? Can the history of one's personal business affairs properly belong to someone else? Can anyone morally claim to own knowledge itself?

These are just a few of the questions for which neither law nor custom can provide concrete answers. In their absence, law enforcement agencies like the Secret Service and FBI, acting at the disposal of large information corporations, are seeking to create legal precedents which would radically limit Constitutional application to digital media.

The excesses of [the FBI's] Operation Sun Devil are only the beginning of what threatens to become a long, difficult, and philosophically obscure struggle between institutional control and individual liberty.

II. FUTURE SHOCK

Information workers, forced to keep pace with rapidly changing technology, are stuck on "the learning curve of Sisyphus." Increasingly, they find their hard-acquired skills to be obsolete even before they've been fully mastered. To a lesser extent, the same applies to ordinary citizens who correctly feel a lack of control over their own lives and identities.

One result of this is a neo-Luddite resentment of digital technology from which little good can come. Another is a decrease in worker productivity ironically coupled to tools designed to enhance it. Finally, there is a spreading sense of alienation, dislocation, and helplessness in the general presence of which no society can expect to remain healthy.

> **Law enforcement agencies like the Secret Service and FBI, acting at the disposal of large information corporations, are seeking to create legal precedents which would radically limit Constitutional application to digital media.**

This statement was originally read by Mitch Kapor at a press conference announcing the Electronic Frontier Foundation on July 10 in Washington DC. For further information, contact The Electronic Frontier Foundation, One Cambridge Center, Suite 300, Cambridge, MA 02142, 617/577-1385, eff@well.sf.ca.us.

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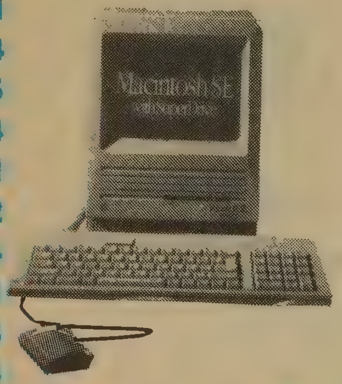

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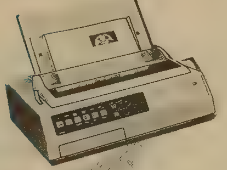

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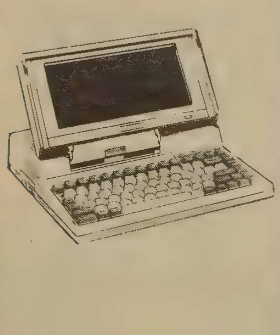

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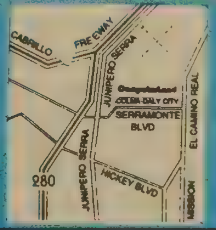

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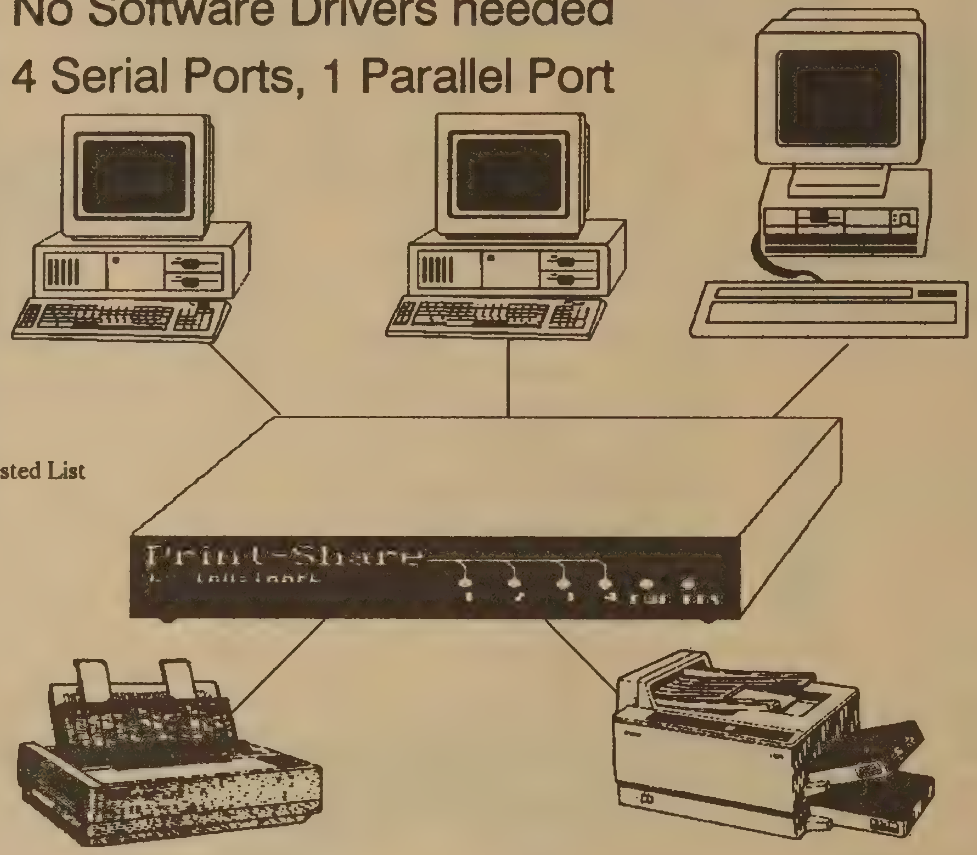

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III. THE "KNOWS" AND THE "KNOW-NOTS"

Modern economies are increasingly divided between those who are comfortable and proficient with digital technology and those who neither understand nor trust it. In essence, this development disenfranchises the latter group, denying them any possibility of citizenship in Cyberspace and, thus, participation in the future.

Furthermore, as policy-makers and elected officials remain relatively ignorant of computers and their uses, they unknowingly abdicate most of their authority to corporate technocrats whose jobs do not include general social responsibility. Elected government is thus replaced by institutions with little real interest beyond their own quarterly profits.

THE ELECTRONIC FRONTIER FOUNDATION

We are founding the Electronic Frontier Foundation to deal with these and related challenges. While our agenda is ambitious to the point of audacity, we don't see much indication that these issues are being given the broad social attention they deserve. We were forced to ask, "If not us, then who?"

In fact, our original objectives were more modest. When we first heard about Operation Sun Devil and other official adventures into the digital realm, we thought that remedy could be derived by simply unleashing a few highly competent Constitutional lawyers upon the government. In essence, we were prepared to fight a few civil libertarian brush fires and go on about our private work.

However, examination of the issues surrounding these government actions revealed that we were dealing with the symptoms of a much larger malady, the collision between Society and Cyberspace.

We have concluded that a cure can lie only in bringing civilization to Cyberspace. Unless a successful effort is made to render that harsh and mysterious terrain suitable for ordinary inhabitants, friction between the two worlds will worsen. Constitutional protections, indeed the perceived legitimacy of representative government itself, might gradually disappear.

We could not allow this to happen unchallenged, and so arises the Elec-

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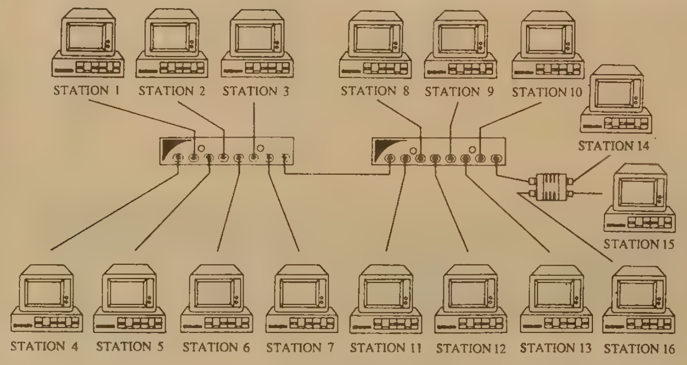

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tronic Frontier Foundation. In addition to our legal interventions on behalf of those whose rights are threatened, we will:

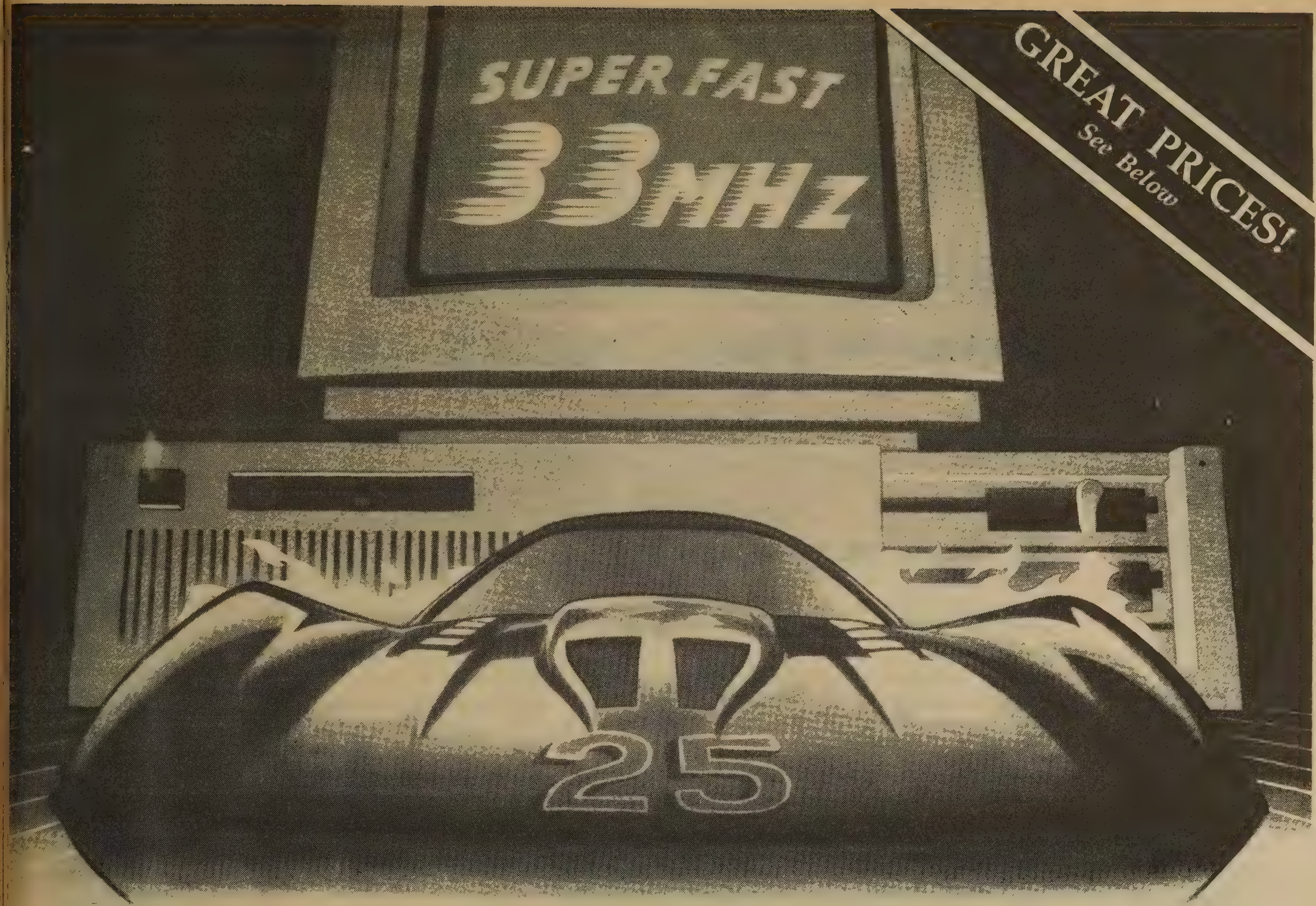
- Engage in and support efforts to educate both the general public and policymakers about the opportunities and challenges posed by developments in computing and telecommunications.
- Encourage communication between the developers of technology, government, corporate officials, and the general public in which we might define the appropriate metaphors and legal concepts for life in Cyberspace.
- And, finally, foster the development of new tools which will endow non-technical users with full and easy access to computer-based telecommunications.

One of us, Mitch Kapor, had already been a vocal advocate of more accessible software design and had given considerable thought to some of the challenges we now intend to meet.

The other, John Perry Barlow, is a relative newcomer to the world of computing (though not to the world of politics) and is well-equipped to act as an emissary between the magicians of technology and the wary populace who must incorporate this magic into their daily lives.

While we expect the Electronic Frontier Foundation to be a creation of some longevity, we hope to avoid the sclerosis which organizations usually develop in their efforts to exist over time. For this reason we will endeavor to remain light and flexible, marshalling intellectual and financial resources to meet specific purposes rather than finding purposes to match our resources. As is appropriate, we will communicate between ourselves and with our constituents largely over the electronic Net, trusting self-distribution and self-organization to a greater extent than would be possible for a more traditional organization.

We readily admit that we have our work cut out for us. However, we are greatly encouraged by the overwhelming and positive response which we have received so far. We hope the Electronic Frontier Foundation can function as a focal point for the many people of good will who wish to settle in a future as abundant and free as the present. ■



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Ultimate Archiving—More'n You Ever Thought

BY JIM WARREN

Last issue's column addressed file-*backup*. This fantasizes of exquisite *archiving* systems. Implement this and make millions!

ARCHIVING: FOR BACKUP AND RETENTION

Archiving saves current files and their directories, but also retains previous copies of those files and directories. This provides error recovery backup while retaining currently unneeded files for future reference or use.

Adequate archiving systems catalog all files archived in all archiving sessions, and their directories. (Information stored with each archive-file permits reconstructing the catalog and directories from the pure file-archives, if necessary.)

During archiving, notes of arbitrary size, format and content can be included in the catalog info for any file, directory subtree, or as part of the catalog's session info (date, time, sources, targets, original file-size, etc.). The catalog includes an annotated audit trail for all archiving activities. It's stored on a single, user-specified medium—not necessarily on the same media as the archived files. The catalog can be copied, independently of the file-archives.

REALIZABLE FANTASIES

THE FAST, SLOPPY APPROACH

The naive, massively consumptive approach to archiving is to disk-copy everything from the source to an archive medium—duplicating all files that were unchanged since the previous archiving session.

Much less wasteful: Only those parts of the source not already stored in the target archive are saved. Files are not duplicated—except as specified by the user for safety through redundundancy.

WHAT'S A DUPLICATE; WHAT'S NOT?

Complications: (1) Between archiving sessions, the user may change a file's name or directory-path, though the file remains functionally unchanged. (2) Executable files—as opposed to data files—may be functionally identical, but have their program modules stored in different order (e.g., resource forks of Mac applications, but functional equivalence can still be detected). (3) Identical files may have different dates—e.g.,executable files compiled at different times from an unchanged source. (4) File compression and encryption create further complications for identifying functionally identical files.

SOLUTION FOR DUPLICATE PROBLEMS

A robust, 12-to-24 digit hash-code can be used to catch almost all functionally identical files—regardless of changes in filename, directory path, creation date or modification date. If modules can have different sequences (e.g., in Mac resource forks), the hashing algorithm accounts for it. Compression and encryption occurs after hash-coding.

Each file's few-byte hash-code is part of the file's cataloged information. New file-archives are flagged as original archive-copies. When archiving another file, its hash-code is compared to those of already-archived originals (much faster than comparing name/date/size/etc.).

For functional duplicates, their (small) catalog information is stored as usual—name, date, directory path, comments, etc.—flagged as a dup and including a pointer to the original archive-copy. The (larger) file itself is not stored.

The user is responsible for avoiding further unnecessary growth in the size of archive storage. The Rule: *Backup regularly; archive selectively; purge periodically.*

ABOUT BROWSING

There are often thousands of files cataloged for a single microcomputer user's archives. A backup or archiving system's utility depends on its browser(s). A browser is used to search for archived files and/or their directories, using the catalog information. The user marks those files and directory paths of interest. Several actions can be applied to the marked items.

A browser of similar style is used when archiving from active files, to browse those active files while comparing them to previously archived files.

Features fantasized for Beautiful Browsers:

Display: The user may display the catalog as a "flat" list of files-only, or as the files with their hierarchical directory structure, or as only the directory structure. Indentation, fonts and color illustrate directory hierarchy. Archive dates may optionally be used as paths from the

The naive, massively consumptive approach to archiving is to disk-copy everything from the source to an archive medium. Much less wasteful: Only those parts of the source not already stored in the target archive are saved.

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Jim Warren founded InfoWorld, *the DataCast proposal for broadcast-based paperless electronic newspapers, Video Initiative, Wireless Digital, Initiative, Inc. and the nation's largest public microcomputer convention. He was founding host of PBS television's "Computer Chronicles" series, founding editor of* Dr. Dobb's Journal, *founding president of the Microcomputer Industry Trade Association, and has chaired various computer professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics.*

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hierarchy's root.

The user controls format and content of displayed information—including fonts, text-sizes, colors, icons, positions, field formats, etc. (Retrospect for the Mac, from Dantz Development in Berkeley, has the most robust capability for this I've seen, so far!)

Searching: The user can browse—a screen-full at a time—the entire catalog of archived files, or any user-reduced or user-excerpted part of the catalog. Browser catalogs can be sorted on any of all of their fields, including directory-path, filename, dates (created, modified, archived, etc.), file-types (program, text, data, creator, etc.), size, hash-code, original/duplicate, and so on. Files may be sought—and marked or unmarked—by typing full-text, first-text or partial-text of any catalog data field(s) or full or partial directory paths. Wild-cards are permitted—place-holders for any character.

Marking: Files can be marked by point-and-click (of course, all modern computers have a pointing device) or point-and-drag across a sequence. One or many files in any part(s) of the catalog can remain marked at the same time.

Action: Once files and/or directory paths are marked. The browser catalog can be limited to those marked (sometimes called a "draw-off"), or those marked can be removed from the current browser catalog. This limits what the browser sees and displays, but does not change the archive catalog. The marked part can be printed with full user control of format and device.

Catalog entries for marked files—scattered through the catalog—may be viewed in sequence. The user can change most fields in a file's catalog data—dangerous but desirable.

For retrieval: Marked files may be retrieved—by file, by directory node, or by directory subtree. The user controls overwriting duplicates and target directory paths.

For reference: Any marked file(s) may be dumped to the screen or printer with the user controlling pauses and formats—text, hex, bitmap, etc.

For purging: Marked files that are not duplicates may be entirely deleted, reducing the file-archive size and simplifying the catalog. Duplicate-references of marked archives can be flushed.

For added archiving: Marked files and their catalog data may be exported to a new archive on the same or different media.

ARCHIVING ADDENDA

Important: Pascal and C utility routines—and documentation—are available to allow user-programmed access to all catalog information and all archived files.

Alternatives for encryption, compression, error detection, error correction, read-then-write, read-write-compare are all under user control.

Encountering mismounted removable media, or limits in size of memory, source, catalog media or file-archive media causes no disorder.

The user may automate/script archiving with a text editor or "watch me". Scripts are plain language in free format. They may be triggered by time or date. Archiving may run in the background with user-specified relative priority.

Of course all this works on LANs, networks, remote servers and remote systems.

Most future columns will be less monopolized by a single topic. But, designing utopias is *so* much *fun!* ■

PONTIFICATE YOURSELF

Send suggestions to Jim Warren, Realizable Fantasies, 345 Swett Rd., Woodside, CA 94062. Published proposals will be attributed to their authors unless anonymity is requested.

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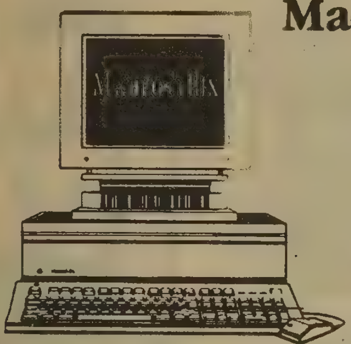

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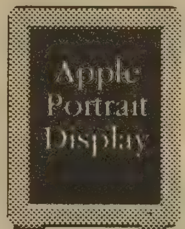

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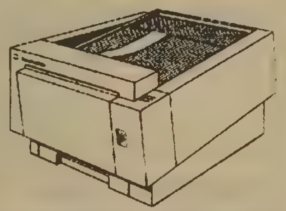

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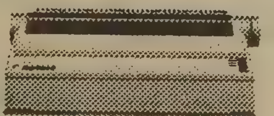

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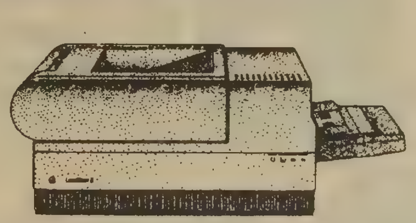

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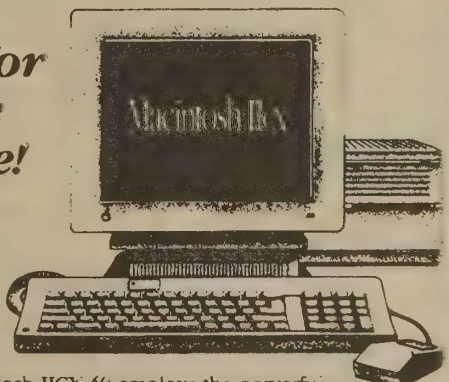

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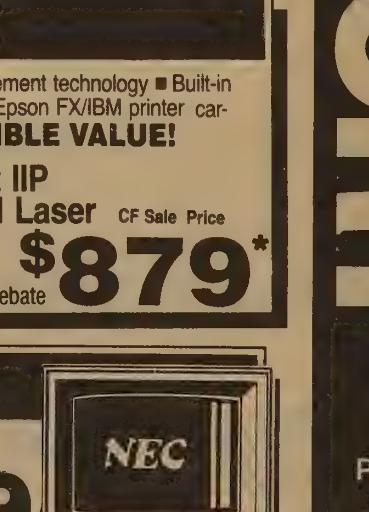

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BUSINESS SOLUTIONS

PC-Based Accounting:

Choosing A Software Package

BY MARGARET WRIGHT, CPA

Accounting software tends to be shrouded in mystery. Not only is information on it not readily available, but potential users often have a hard time figuring out where to go to buy it.

Accounting software is not like other software applications such as spreadsheets or word processing and database managers. If you want a spreadsheet package, you can walk into any software store and walk out with a copy of Lotus 1-2-3 under your arm. If you want to learn how to use Lotus 1-2-3, you can sign up for classes at your junior college or local business school, or you can choose from a vast selection of books. In addition, a small army of consultants will train you and help you set up your spreadsheets.

This is not the case with accounting software. It is not generally available; many software stores don't even carry accounting software. There are very few books available on specific packages, and no training classes offered to the general public on accounting software. Knowledgeable consultants are difficult to find, and until very recently, articles about accounting packages were nonexistent.

FINDING A SOURCE

Part of the reason for this is the way the software is marketed and distributed—which brings us to the nature of the application itself. In order to understand accounting software, you have to know some accounting. Because many businesspeople are not thoroughly versed in accounting, accounting software vendors often feel that the application is too sophisticated to sell to end-users through retail outlets. Instead, each accounting software producer has instituted its own network of "qualified resellers" and "qualified installers," the idea being that end-users need help to set up and use these systems. Each company has its own program to train and provide assistance to qualified resellers and qualified installers to help them become familiar with its products.

Qualified resellers sell accounting software. A reseller may be a software store, a computer consultant, or an accountant. Similarly, qualified installers who set up accounting systems, train users, and provide ongoing assistance to end-users are typically accountants or computer consultants.

Although the reseller and the installer may be one and the same person (or firm), most often they are not. Resellers usually have a general knowledge of the software they sell, whereas the installer should have a thorough knowledge of the software he or she is consulting on. Resellers may sell one or two accounting packages, or as many as a dozen or so. Likewise, installers may consult on only one package or several. Often, a computer consultant or accountant has experience in only one, or at most two accounting packages.

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ALSO IN THIS BUSINESS SOLUTIONS SECTION:

Reality Check: On The Road With A Mac Portable

By Mary Eisenhart

Lightweight it's not. Functional and truly, uncompromisingly Mac-like it is, and for the traveling Mac user it's often the best option

See Page 162

Local Area Networks

By Wayne A. Yacco

Troubleshooting software and diagnosing network conflicts.

See page 168

The Dell 386LT Laptop: Expandability, Flexibility, Connectivity

By Ed Kahn

The Dell 316LT is a superb computer, competitively priced, with all the features you'll want. It's not a notebook computer, but a full-size 15 lb clamshell-style portable.

See page 170

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ACT1PLUS, ACCPAC Easy, BusinessWorks, DacEasy, Data Pro Accounting Series 1, One Write Plus, Peachtree III, Profitwise

3. $300 to $600

Abacus Jr. ACCPAC BPI, DacEasy Easy Network Accounting, Data Pro Accounting Series, RealWorld 4-in-1

4. $600 and up (typically sold by module)

Abacus II, ACCPAC Plus, CYMA, Data Pro Accounting Series, Great Plains, Macola, MAS90, Open Systems, Platinum, RealWorld, SBT, Solomon III

Note: software in this group is usually sold by module, which runs between $600 to $800 per module. A module is an accounting function such as Accounts Payable or Inventory

The only way you'll get what you need is by doing your homework and asking a lot of questions. Even if you plan to turn the whole computerization over to professionals, only you really know the needs of your business.

Chances are that when the potential user finds an expert to consult, the expert will recommend the product he or she is most familiar with. A few firms have expertise in many packages, and these companies are in a position to help the potential end-user choose the best package for a particular business. Otherwise, the potential end-user must choose the software, find a reseller to sell him the software, and then find a consultant to help him set it up and use it.

So the difficulties of setting up a computer-based accounting system are a function of a complex application with an obscure distribution system. The next question is: where do you begin?

ASSESSING YOUR NEEDS—EVERY BUSINESS IS DIFFERENT

As with any purchase, to get what you want you have to know what you want. Keep in mind that within the guidelines of acceptable accounting practices there are many different ways of getting the job done. Two similar companies in the same industry could have quite different accounting/bookkeeping requirements, in which case different software packages might be appropriate for each of them.

The best place to start is probably in your own file drawers. Your business currently generates three types of output: business forms, which includes such things as invoices, customer statements, purchase orders, and picking tickets; external reports, which include all forms that have to be submitted to governmental agencies and outside authorities such as bank compliance reports and sales, income, and payroll tax reports; and internal reports, for company use only, which give you information to manage your business, such as inventory levels, or aged receivables or payables balances.

Gather together an example of every form and report that your company now produces. These forms and reports all have information on them that must be generated by your prospective accounting software. Analyze the information on the forms and reports, as well as their layout and general appearance. Determine if there are any changes that would improve either the quality of the information or the appearance of the form or report.

Next, determine what other information you'd like to have readily available that you don't have now. Would you like an instant printout of the bills coming due together with a cash projection, or automatic comparisons to budget? Determine exactly what additional information you want, and how you want it to appear.

You are now in a position to start looking for software that will produce the output you want. The only way to get what you need is by doing your homework and asking a lot of questions. Even if you plan to turn the whole computerization over to professionals, only you really know the needs of your business. You are sure to get a better product if you're an informed customer.

After you have a clear understanding of what you want the accounting software to do, try calling around to stores in your area and ask if they carry accounting software packages, and whether they work with outside consultants. You'll be amazed at the different responses you get if you make a dozen calls.

Computer stores that sell accounting software often work with independent consultants. The computer store/independent consultant team can be a winning combination for the business owner trying to computerize his accounting function. This is particularly true if the store and the consultant have been working together for some time. (Keep in mind that, in this business, six months is a long time). Don't be shy about asking for references to satisfied customers.

Consultants come from a variety of backgrounds. In general, most software consultants are either computer specialists who have learned some accounting, or accounting specialists who have learned about computers. In either case, make sure the person working with you knows both. Many CPA firms are adding accounting software consulting to their practices. If you already have a CPA firm, they may consult on microcomputer systems. Be careful though—the fact that a CPA firm does excellent tax or writeup work doesn't mean that they will do excellent computer work. By the same token, just because a computer consultant can re-sector your hard disk, don't assume he or she knows how to design a chart of accounts.

To confuse the issue further, a few of the less expensive accounting packages are sold "over the counter", i.e., without a network of qualified resellers and installers. These packages include a few that sell for under $100, such as Quicken, and a few somewhat more expensive packages, such as Peachtree, DacEasy, and ACCPAC BPI. A computer store salesperson may offer to set up one of these packages for you.

If you have done your initial analysis, and the computer store salesperson can knowledgeably answer your questions about whether the package will do x, y, and z for you, then this may work out for you. However, if anyone tells you that Brand X accounting software will do the job for you without having analyzed the needs of your business, run in the opposite direction.

Remember, there is no accounting software package that does everything for everyone. What matters to you is that the software does the things you want done.

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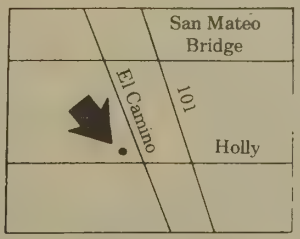

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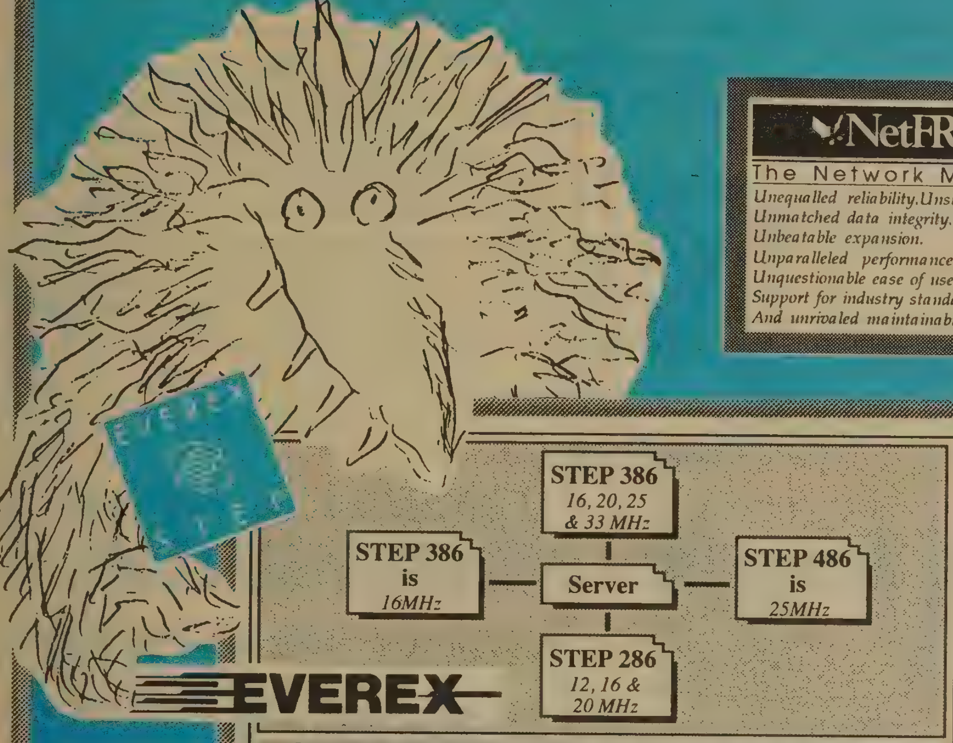

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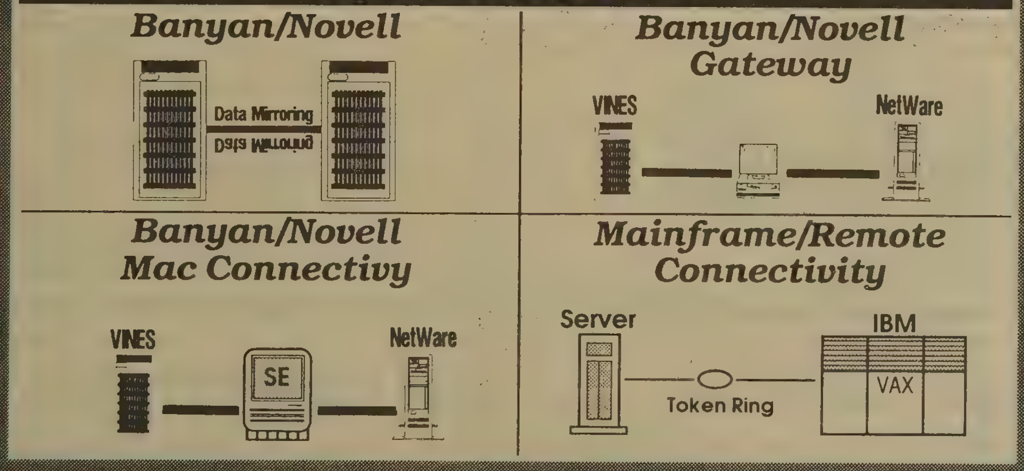

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SOFTWARE CATEGORIES

Accounting software for personal computers can be grouped roughly into four categories based on price (see figure).

Accounting software that costs under $100 is generally easy to use and focuses on your business's checking account. This group of software products will keep track of cash coming in and going out of the account. It is possible to generate a few summary reports that show how much you spent on each type of expense. Quicken is the most popular software in this group.

For the most part, these software products are not double entry systems, which has advantages and disadvantages. The primary advantage is that you don't have to know a debit from a credit. The disadvantage is that these packages cannot accommodate any but the most simple record-keeping transactions. If your business is very small, and if the most sophisticated financial task you do is keeping track of your cash and filing your taxes, this type of software may be adequate for your needs. For $100 it may not hurt to give it a try.

If anyone tells you that Brand X accounting software will do the job for you without having analyzed the needs of your business, run in the opposite direction.

Most businesses, however, will need more sophisticated accounting software than that available for under $100. The more expensive accounting software packages (those over $100) are all double entry systems. Unfortunately, since all accounting packages attempt to perform most accounting functions, there are no clear, distinguishing features that separate accounting software in the $300 to $600 price range from accounting software that sells for over $600 per module.

It's not possible to make generalizations of the sort, "if you have more than

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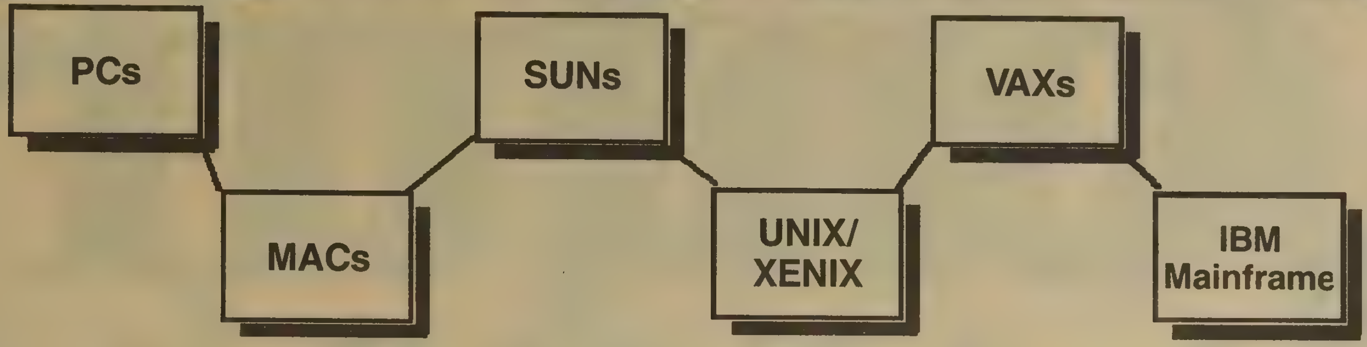

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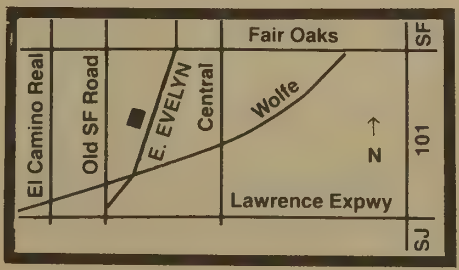

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Venture In A New Decade

By Mary Eisenhart

Venture capital—it's been the lifeblood of many a successful high-tech enterprise. Investors willing to accept high risk in return for high potential rewards were vital to such startups as Lotus, Sun, and other companies that are now household words.

Of course, there've been horror stories. Enterprises that, for whatever reason, went belly-up taking good money after bad. "Vulture capitalists" who oust unwary founders from their enterprise. And lots of struggles that never pay off.

The microcomputer industry has come a long way in the last ten years, and the venture capital community has changed considerably as it looks to the new challenges of the future. In a sadder-but-wiser world, there's more experience to draw on, and there's also a lot less money.

In a changing and increasingly competitive marketplace, venture capitalists are focusing on problem-solving beyond the mere infusion of money, contributing expertise and networking abilities to help their portfolio companies.

For our venture capital profile this year, we feature two young Bay Area venture capitalists who specialize in adding distinctive value to companies in particular niches. Ann Winblad is a partner in a brand-new firm, Hummer Winblad, which invests exclusively in software companies. George Hara has been involved in US-Japan high tech for years and works to help US companies set up joint ventures in international marketplaces. Both have unique expertise and perspective, and offer some useful insights about the issues facing the high-tech industry as it moves into a new and very different century.

Capital

Software Entrepreneur In The VC World

New Venture Fund Specializes In Software Companies

Ann Winblad never set out to be a venture capitalist.

When she got out of college, she got a job as a programmer with the Federal Reserve Bank of Minneapolis. After a year, she quit to start her own business—a decision she attributes at least partially to naiveté: "I think if I'd had more sophistication about starting a business and not been a typical entrepreneur, I would've thought, 'Boy, this is a lot of hard work. Most businesses fail...' But I really didn't know anything about business except that these business classes in school seemed pretty easy, especially compared to the math major."

She got a contract to design an accounting system for a state school, and brought in some of her former colleagues from the bank. Open Systems Inc., a

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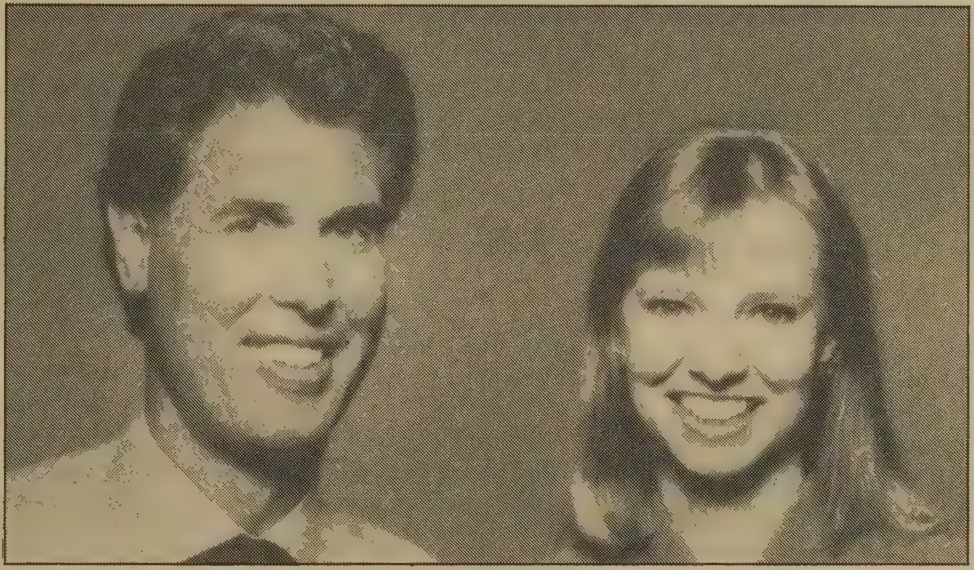

John Hummer and Ann Winblad are partners in Hummer Winblad, a venture capital fund focused exclusively on software.

VC In The Us-Japan Market

Pioneering The Multinational High-Tech Startup

As a venture capitalist, George Hara has been an investor in such successful startups as the Santa Cruz Operation and the Wollongong Group, and was recently appointed to Borland International's board of directors.

As an international entrepreneur, Hara is the founder, president and CEO of DEFTA/Data Control Ltd., a multifaceted operation that includes multiplatform networking software development, venture capital, and consulting and support services for companies doing business in the Japanese market.

Instead of going into the family business back in Japan (that being Kokuyo, the country's largest manufacturer of office supplies), Hara set his sights on broader horizons. While studying at the Stanford Business School ten years ago (in the course of which he also earned a master's degree in engineering), Hara conceived the idea of what he calls "the multinational high-tech startup," a company that's international from its very early stages and able to draw on the best resources of each participating nation.

In today's increasingly interdependent global economy, Hara believes the time is right for his idea to come to fruition—on the salutary principle that cooperation is often more profitable for all concerned than fighting.

Hara's work in support of such cooperative efforts extends far beyond the operations of his own business. He's served as advisor to the governor of Osaka, a region currently embarked on an ambitious plan to become an international high-tech center, and is a key participant in the Senri Project, a collaboration of private investors seeking to build

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PHOTO: MICHAEL JAY

Entrepreneur and venture capitalist George Hara helps high-tech firms in international markets.

Software Entrepreneur In The VC World

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supplier of accounting software, was off and running. "To start the company I borrowed $500 from my brother, which was the incremental cost of incorporating that was not in my savings account. That was our only outside capital, and we went from zero to $7 million in sales in five years."

Winblad ran the company profitably for six years and, in 1983, sold it for $15.1 million. She moved to California, did consulting projects for such companies as Apple, IBM and Price Waterhouse, and wrote a book on object-oriented software which has just been published by Addison-Wesley. And one day a venture capitalist friend asked her, as someone familiar with the intricacies of the software business, to take a look at one of its disappointing investments, a southern California software firm. She recalls being told, "We're about ready to pull the plug on this thing, but we want to make sure that we know how to diagnose death correctly for a software company. Maybe it's just sick."

The patient, says Winblad, was quite dead, but in the course of the extended funeral arrangements she met John Hummer, whose VC firm, Glenwood Management, also had an investment in the defunct company. Hummer wound up taking the software house through Chapter 11 and arranging the sale of its source code to its competitor, constructing in the process a royalty arrangement which has, to date, allowed the investors in the original company to break even.

Hummer, who holds a bachelor's degree from Princeton and an MBA from the Stanford Graduate School of Business (where his MBA class included the likes of Vinod Khosla and Scott McNealy), is somewhat unusual among venture capitalists in having played NBA basketball for several years. He was a partner at Glenwood from 1982 to 1988, and distinguished himself with noteworthy investments, e.g. Octel, a seed deal in 1982 that's now a publicly traded company valued at over $400 million.

"John was pretty typical of most venture capitalists," recalls Winblad. "Everybody dabbled in software occasionally, but nobody really knew how a software company operated, because the genesis of this whole business is semiconductor and hardware. It really is not the same business model as a software company at all. So a lot of money has been lost in software, though some has been made."

She found herself doing consulting for Hummer's fund and turned down the CEO position at one of its companies because she still wanted to work on diverse projects. And when Hummer tried to recruit her for a fund he was thinking of starting, "I said, 'Why would I want to be a venture capitalist? To me that sounds like surrendering to the enemy. I would feel really bad to be called a vulture capitalist.'"

However, in 1988 Shearson started its own fund and recruited Hummer as its head. He agreed on condition that he could choose his own partners, and recruited Winblad with the notion that the firm would deal exclusively with software companies. "It really felt like the right thing to do," recalls Winblad, "and if we could pull off this focus, we would be the only fund anywhere focused solely on software."

By the time Hummer Winblad Venture Partners opened its doors last fall, corporate turbulence had taken Shearson out of the picture, but the partners were working with a $35 million fund invested by such organizations as 3M, Princeton University, and IBM. "As far as I know, we're the only new fund that has been built with institutional money in the last two to three years. We have really great investors," Winblad says.

So far, the company has made three investments in very different companies: Oregon-based Central Point Software, purveyor of the bestselling PC Tools line of utilities; T/Maker Company, publishers of WriteNow and the ClickArt series; and Slate Corporation, a startup in Scottsdale, Arizona specializing in application software for computers that recognize handwriting input. (Slate's founding team includes Dan Bricklin and Bob Frankston, creators of the first spreadsheet; Vern Raburn, current chairman of Symantec; Thomas Byers and Dorothy Hall, formerly of Symantec; and Mitchell Stein, creator of the TrueForm forms processing program.) Winblad serves on the board of directors for each company.

The partners are about to relocate their headquarters from San Francisco's Financial District to new offices in Emeryville because, Winblad says, the concentration of software companies and the support services they need is quite good in that area. "There's hardly anywhere left in the Bay Area where a software company can have inexpensive office space, fairly inexpensive housing, and some density of people moving in and out that they can use as contractors. The Berkeley-Emeryville area has pretty much stayed like that, so it's a really great place for us to be with critical mass in one community."

As a brand-new VC firm, how did Hummer Winblad succeed in attracting funding?

We were fortunate that we had early commitments from three venture firms who have a total of $2.5 million in our fund—Sequoia, Asset Management, and Bryan and Edwards. Also, early on we got a strong commitment from 3M Corporation and IBM Corporation.

With that early momentum, we were able to build towards our final fund size of $35 million. With $35 million, we should be able to fund 15 to 20 software companies, which is a substantial number.

Last year, for example, there were just over 30 seed deals done, meaning brand-new guys with business plans saying, "Here's a plan, I haven't done anything yet, but we're a good team and we can really do it." In all areas—biotech, hardware, software, anything high technology. That was down from the year before, where there were only 43. So it's harder and harder for young companies to get capital from the venture firms, especially at the early stages.

One of the reasons we were funded, I think, is that our limited partners believed that this is a new business for us. We've both been very successful in our careers to date, and we have a vested interest in proving we can be successful at this venue as well. So we will work harder than someone who's maybe in mid-life in the venture community.

We were competing with some of the venture firms that did not do well in returns in the 1980s. There wasn't any extra money on these tables saying, "Well, I hope a new fund shows up so we can give them this money." It was more like a game of musical chairs. Last year the number of chairs got smaller, and when the music stopped, if you happened to be sitting in a chair you got the money. At the time we were raising our fund, there were 140 venture funds raising money. Some of those were funds that had been around for a while that did not get refunded.

We probably gave, on the average, five to seven presentations to each of the people that committed to our fund. We hauled out the dog and pony show. We completely wore out a slide projector. It took us a little less than nine months to raise the fund.

We've been seeing companies since October. In the first six months, we reviewed the plans or saw 160 software companies, startup and existing. We funded three of those companies.

What advantages are there to concentrating exclusively on software, and what do you hope to be able to achieve by doing it?

Oh, the advantages are tremendous. Every day all we think about is software. We do field trips—we spent half a day at MIPS the other day, we spent a day at Sun, we spend a lot of time with Apple people. So we're not too far away from the hardware people selling the machines that support the software that we invest in.

Many of the things that we see that cross our desk aren't even plan-like—where people may send us a two-page fax saying, "I'd like to talk to you." We really encourage people, before they spend two months holed up writing their version of the Business Bible, that they give us a preview with a few pages of facts so we have a basis on which to talk to them. To say, "Well, do you have a business, or do you have a product?"

I would guess that we see a lot more products than we see businesses. We'd also like to see many of these products live. For example, we have brought at least one product acquisition to Central Point Software, which was one of our first investments. A young company that wasn't really looking for very much capital and would have had a tremendously difficult time competing in the distribution channel with Central Point, Norton and Fifth Generation. One of the programmers and key architects is already employed at one of our companies, and it's likely the other will be employed at one of the other ones.

So even when companies have ideas which for a number of reasons may not get financed, there's so much leverage and capability for us to get people connected the right way with products or people. That benefits not only companies that we've invested in, but other companies we work with in the software community as well. That leverage would not be enjoyed at all if you had a diverse portfolio.

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Every time we see a software company, we learn something about the dynamics of the software business. We're always moving further into the future every day, where people have these seed deals where it'll be one to two years before the software comes to fruition. We become permanent members of the University of Software by doing just software deals.

We leverage all our contacts as well—when we do good deeds for the software industry, they're returned to us. It's not disconnected, like if we spent one hour on biotech, and the next hour on semiconductor companies, and run off and really figure out how modern fab plants work. Everything we learn about how companies grow, we can contribute to the smaller companies.

One of our investment companies has one of the best MIS systems I've ever seen for processing orders, for doing their accounting, totally real-time and really good. They built it themselves, and they're happy to license it to the other software companies we've invested in at a very reasonable rate. When there's a dynamic—people, technology, issues—we can really network our own portfolio companies, as well as the people we've gotten to know in this industry.

Many of these companies don't need very much money. When we invested in Central Point Software, they had a very robust balance sheet. They really didn't need any money, nor did they want any money. So over a six-month period we said, "Pretend we're investors. Give us some tasks. See what we're made of. See if there's value added that we can deliver beyond money." They gave us assignments; we helped out with a number of things and showed them that we were a little bit further along on our maturation curve and our knowledge of how companies work; we had some long-term connections in the software industry and a knowledge of how things work, so they could get up on the learning curve faster by being associated with us and having one of us on their board.

We like to do a lot of that. We like to prove to companies that don't need money that perhaps it's of value to have them sell less than 15% of their shares to us, get us on the board, get us involved. Have all this leverage from us spending all of our day looking outside of their companies funneled into their business as well.

We can't just have one person working on software to make that happen. That person would die. We think that we can work closely with a number of companies, that we can prove that we can yield value beyond money. But that takes time, persistence, and a lot of looking around to see who those companies are.

You have three very different companies in your portfolio currently. What were you looking for, and what attracted you about them?

Central Point is fairly obvious in that they are really an up-and-coming company. They had $24 million in sales last year, and 22% after-tax profits. When we invested last year, they appeared to be overtaking the market leader, Norton, which they did. They also really hadn't even caught the height of their growth. They have over 40 developers in-house; operationally they're incredibly sophisticated and efficient. We love the CEO and founder, Mike Brown, and the president, Corey Smith.

People, cohesion, the ability of the people to work together, technology—it was all there.

Did you see *Field of Dreams*? We ask new companies with just seed deals: "If you build it, will they come?" If they can answer yes, then we'll probably invest.

We also look at cohesion, how well the people work together, because that's very, very important. All those things were there with Central Point. Central Point has just finished its first quarter this year, $16 million in sales and in excess of 22% in after-tax profits again. So Central Point will match all of last year's revenue in almost the first five months of this year; they are on a very fast track, they are well managed, and they're young, so there's a lot of energy and willingness to grow and commitment to the business for a long period of time.

They built their European subsidiary over the last six months, and I just visited their European headquarters to meet the people there, and see how real Europe was. It's very real. So Central Point will do a little more than double their total revenues, and they will triple their European revenues, which will go from 20% of revenues to 30% this year. It's a very focused and well-managed effort.

T/Maker is a little company, with $3.2 million in sales last year. I'm happy to report that this year in the first five months they've already done almost $2 million in sales, so they'll double their revenues this year.

There, we saw a company that has outstanding management—Heidi Roizen is a product in herself, and Royal Farros is incredibly committed to product and product design, and very good at it. They really wanted to make a commitment to growth—I think that one of the reasons is that they saw a lot of their young associates growing companies and getting paid for it in the sale of their companies or public offerings. And they realized to reach that goal, the financial rewards in this business, they'd have to make a commitment to growth.

Which is something of an about-face for a company who sold First Publisher to Software Publishing rather than make T/Maker grow too fast.

Exactly. We don't like to invest in companies where their main motivation is "I want to make a lot of money." We have to see a healthy amount of greed there; there has to be some goal. But most of the companies need to want to win. That's what motivated me in running my company—then one day I got a very large check for winning.

You have to kind of be motivated that the prize at the end might just be a piece of paper saying "You won." Or the prize at the end might be a lot of money. In this business it tends to be a lot of money, if you really, really do a good job. But for the people that are really involved in the industry, that's so secondary to the idea of really competing.

I can honestly say that I was a real entrepreneur—the company started in my house, three of the bedrooms were offices, I slept where I went to work. We were a sweat equity startup. And why would somebody do that to themselves when they could go get a really high-paying job? Because most of the people in the computer industry are pretty smart; they can all go to work at really high-paying jobs somewhere. But instead they dedicate great portions of their lives to growing companies.

> **"We don't like to invest in companies where their main motivation is, 'I want to make a lot of money.' We have to see a healthy amount of greed there; there has to be some goal. But most of the companies need to want to win."**

A 35-year-old friend of mine has $30 million in net worth right now, but it occurred to him the other day that the people he really likes are 30, not 35, because for five years there was something that really didn't happen for him because he was just there in front of his terminal, not living life at all. We're not asking people to give up their lives, but we have to see that the motivations are really high and really strong.

The really nice thing about this industry, especially software, is that if you do a really good job, you are extremely well rewarded fairly quickly, compared to many other industries.

Slate, on the other hand, is a longer-term project, being dependent on hardware that isn't there yet.

Probably only 20 or 30 companies will get seed capital this year. This will be one of them. We funded this company with Kleiner Perkins; both Kleiner Perkins and Hummer Winblad have a board member on the board of Slate.

Of the three companies we have completed deals with now, this is the highest risk. But the highest risks also yield the highest rewards, potentially. We really invested in people in this case. I've known Vern Raburn, Tom Byers and Dottie Hall for a long time, pre-Symantec. Dan Bricklin is probably one of the best engineering managers, let alone one of the best design guys, in the industry. We've been fortunate to recruit Bob Frankston, essentially Lotus's chief scientist, into the company.

Dan Bricklin, the creator of the spreadsheet, is now 40 years old. He's the kind of guy where you say, "Dan, you've got a lot of this application written by three new programmers. Are you sure we'll be able to use this code?" And Dan will say, "I read every line of that code on the plane out here. I've done a complete code review, and yes." Not like, "Well, I suppose so..."

Here, the things I think are the risk factors are that we're dependent on external events. We hope that the hardware catches on and comes to market in a reasonable period of time. So we're depending on other startup companies being well run and being successful. Like Go Corporation, and some of the

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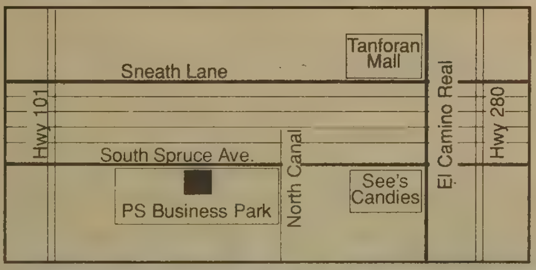

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Japanese technology like the Sony Palmtop, or GRiD getting the next generation of the GRiDpad out. We don't have much control over those events, so we try to be allies of those companies and work as hard as we can for them as well.

This team is an incredible team. It's not like a seed deal where two programmers from Bell Labs come in and then they say, "We've got this great product; by the way, how do you start a business?" There's none of that here. There's also not any laziness—they're all taking this very seriously.

And we're very serious board members as well—it's our responsibility once a month, in phone conversations and in meetings with them, to ask the serious questions. To be the people that don't have to have our nose to the grindstone every moment so we can look around.

In companies or individuals that might approach you for funding, what are you looking for?

We want to be able to say that this company is going to have an unfair sustainable competitive advantage. At the end, after we do all the due diligence, we ask ourselves that question.

What does "unfair" mean?

That nobody else will have it. Where the competitors will say, "It's not fair—they have this." It means an extra competitive advantage.

They might have access to some technology. They might have a closer relationship to a hardware vendor. But they have something that the other competitor cannot get.

We really look at three things—the team, the technology, and the fit of the product to a market. The team's really important, and the team might be one person. The product might be one product.

When it's brand new, when it's not an ongoing business, we probably also will try to figure out what the milestones are, and determine how many milestones we'll fund to, to build value so the company doesn't need to sell as much of the company to venture capitalists at the lower rate they would get as a new company. We'll figure out what is the milestone to the next value, and fund to that, or maybe the first two, so that when additional capital is needed, it can be funded at a higher valuation.

That's very beneficial to the entrepreneur—I think it's really a bad idea for startups to go in and say, "Oh great! I want $2 million and I just got it, and I gave up 60% of my company."

A lot of people come out really unhappy from deals like that.

But they do it. Nobody forces them into it, and they do it. And they should think about walking away, or find some other way to make sweat equity get further, because it is really, really hard. Once you give up that first 60%, you may need additional money. Then you're down to where you only own 10% of the company. Which might be fine, but I think you're a lot more motivated if it's yours. You don't want to come in and say, "Oh gosh, what are these VCs going to tell me to do today?"

There's an excellent article in *Upside* magazine about this—these MBA-type VCs are on boards, and they have these kind of snotty attitudes about "Hey, we've got clean hands, and this is the way you do it." Versus people who really came from the trenches.

I think it's a very difficult decision for someone who's been successful in their own industry to think about being a venture capitalist, and I wouldn't be one if John Hummer hadn't pounded on me for three years. And now I'm really happy that I'm a venture capitalist.

In 1981 we had venture capitalists come to my company and say, "We want to give you money." We said, "We don't need any money, but there must be a lot of easier ways to do a lot of the things we're doing. Do you know what they are? Help us! We're in Minneapolis, not Silicon Valley—if you can tell us how these things can be done better, we'll give you our shares at an incredibly low valuation."

I remember my partner saying, "These people can't help us at all; they don't know anything about software." They wanted to invest in the company because we were a good company, and anyone who would've invested at that point in time would've made a bunch of money, because we did sell our company for quite a high price. But I think that venture guys have to demonstrate that they're going to work hard for these companies and that they have value to add, that when push comes to shove they're going to go out and help recruit people, they're going to call up the people they know in the software industry, they're going to help them with acquisitions, they're going to deal with a whole lot of problems that you don't know till you meet them.

At Central Point, all the people running the company are in their early 30s. Mike Brown is 32. At T/Maker everyone's 30-32 as well. I started my company when I was 24, so by the time I was 30 I'd run a company for six years, so I have five or six years on most of the people who are running these companies. Those years I learned a lot, and I didn't know any of that stuff the first few years. They don't teach you much of this at the Stanford Business School. You have to learn it by doing.

Also, we use a lot of advisors to our fund. Charlie Jackson of Silicon Beach is an advisor to our fund. Charlie is really hardcore—it was a sweat equity startup, he had one small investor in the company, he really, really worked toward profitablity. Profit early on is key for software companies.

He's looking at a company for us today. We've already done the due diligence; we've decided the team is really good, we've decided the technology is good. We are not sure about how the product is going to fare outside of the Macintosh market, in the Windows and OS/2 market. We have our opinion, which is fairly high, and we use Charlie as kind of, "Does Mikey like it?"

We don't think we're omnipotent and know everything, but we want to bring as much strength to our investments as possible.

On the whole, do you think it's more difficult for a startup to be successful now than it was, say, five years ago?

I think that starting a new company in any business is difficult for anyone. I think the thing that people have to realize is that usually there's no immediate hits here. Central Point was founded in late 1982; it's seven years old. Microsoft was founded in 1978 and it was eight years later, in '86, that they went public. People forget that these are businesses where it takes a while to build a franchise, to catch your stride from Release 1 of the product. Charlie's business was a few years old before it hit its $11-12 million mark in revenues.

It's fairly easy to get to about $3 million in sales; it's much more difficult to crack 10. Once you crack 10 you've got a real strong chance to really start moving on to the $20-30 million mark. Then of course there's the next critical mass thing, which is—do you have enough diversification to lead you to $100 million, or are you stuck?

We've had some really bad stories, like WordStar and Digital Research, where they looked like they were moving right along, and all of sudden it was like the edge of the cliff and they just fell off. Those are really horror stories for a lot of software companies, but we can learn something from them, that technology marches on and you have to keep marching. This is not something where you build a La-Z-Boy and someone's going to buy that ugly old thing forever because there's a lot of old people who like to lean back in their chairs and the design pretty much stays the same. There are very few things in the software industry that stay the same. So keeping a high quality set of programmers, recruitment, and keeping your quality standards as you grow, is really key.

For people wanting to start a company—it is very difficult to get venture financing, and companies, when they go off to do that, will spend three to seven months getting financing, even the ones that are really good companies. And some of them will go the whole way and get rejected. So it's important, if you want to get started, that when you go out to raise venture money, you have a contingency plan. If somewhere along the line it appears that you're not going to get the money, you know what you're going to do instead.

It's also really important, when you go to raise venture money, that you know it's going to take a while. We have to check out the people, we have to check out the users, we have to check out the technology, we have to size the markets. We want to make sure that when we sign up for the risks that are ahead, we signed up because we really believed in this. We signed up knowing a lot of the pitfalls, even the ones that you didn't point out, so we can help you navigate around this minefield called the software industry.

Is there room to grow big companies? Absolutely. If you compare it to what was running five years ago, almost all the software that exists today is incredibly different, and the software we'll see five years from now will be incredibly different. The idea of having integrated multiple data types—image, text, numbers, multimedia—who thought we'd have all this inter-application capability with diverse types of data? I take for granted that I can clip drawings and images and graphs and charts into any kind of word processing document, and that was almost a whole new set of companies that created that capability in software. And there's more and more capabilities to come in software, so I think the opportunity to build a $100 million company here is there.

It's not going to be there for 50 companies. (Hummer Winblad Venture Partners, 415/931-5579; Fax 415/931-6137.) ■

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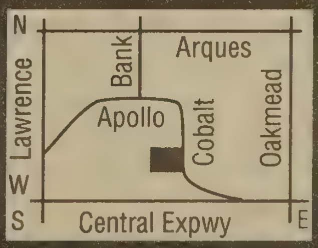

continued from page 47

a full-service international high-tech city. He's also worked extensively, twice as chairman, with the Alliance conferences, which are held each year in Japan to bring together US and Japan companies as possible collaborators in joint ventures. The grassroots networking approach of the Alliance conferences found favor with many businesses; Texas Instruments Asia president Norman Neureiter wrote Hara, "Let me compliment you on devising the 'Alliance' approach to solve the problems of bringing smaller US companies into productive contact with Japanese companies. I believe you have found a very useful mechanism."

While the richness of the Japanese marketplace is legendary, many US companies find it all but impossible to penetrate barriers between them and their potential customers, from cultural difference to distribution channels.

Hara contrasts, for instance, the different experiences of Apple and IBM in the Japanese market to date. Apple has historically given very little autonomy to its local operation, and the constant upheavals and policy shifts from Cupertino have not gone over well in a distribution channel whose watchword is stability and responsiveness to the local customer. On the other hand, when the PC came out in 1981, IBM took a big risk in listening to its Japanese management, who said the machine, lacking a mouse and Kanji capability, was wrong for the Japanese market. It allowed them to develop the incompatible 5550 series, which runs Japanese MS-DOS and did quite well.

Creating an international win-win situation is a tricky undertaking in an era where politicians garner easy votes with Japan-bashing (and their Japanese counterparts often do likewise), cultural misunderstandings abound, and most of the participants are dealing with the problems of a startup business anyway. But Hara's committed to furthering the process.

"To change the politicians' mind is very difficult," he says. "But by creating thousands of strategic alliances between US business and Japanese business, and entangling their interests, that's another way to stabilize economic and political conditions. That is a grassroots-type activity, so it takes a longer time, but I believe it is much more effective than just creating treaties between US and Japanese governments that can be changed overnight."

What was the idea behind the multinational high-tech startup theory?

When I came to Stanford about ten years ago, the first thing I noticed was a different attitude of the students in Japan and the United States. Usually the best students of the good schools in Japan all want to enter large corporations or the government. But at Stanford Business School there were no such students; they all wanted to go to the smaller companies, or start their own eventually, although they might not be able to do it immediately after they graduated.

So I was very interested in such a difference.

Also, that was 1979. Steven Jobs started Apple Computer in 1977. He came very often to Stanford, and other entrepreneurs too. And their appearance was so different... I was very shocked.

I started to interview those entrepreneurs in the Valley, and found out that many of the smaller US companies have been successful within a couple of years, growing up to more than $100 million in sales in two or three years, from scratch. That never happened in Japan.

So I started to be very interested in how they did it, and I found out venture capitalists were backing those entrepreneurs.

And this is not common in Japan?

At that time, there was no venture capital. Even the term venture capital didn't exist. I didn't know the word either.

Japanese venture capital firms are all owned and started by Japanese financial institutions. As a result, the top management of Japanese venture capital firms are all appointed from their parent companies, where they are trained risk-averse. They do not take any risk to help the early startup. So if you take out the portfolio of Japanese venture capital companies, it's all medium-sized companies with long histories, 10-20 years, not growing fast, but with little chance to go out of business.

The role of Japanese venture capital is completely different—they are not so much interested in helping from scratch; it's to find out if the company has an opportunity to go public and introduce it to their parent companies, so the parent company makes money.

The Japanese investor is more security-oriented. More conservative and more long-range. In the States, it's very challenging. I think the West Coast, California, still has the frontier spirit. Many people are starting new companies in this particular area. Lawyers and bankers and media people and others are all set to help the entrepreneurs. That's a major difference. In Japan many people think of starting new companies, but they cannot get support.

I started to analyze the important ingredients to start new companies. We have to have the people—the entrepreneur. The idea, technology. And money—capitalization. These three are available here, and they can be called the three static ingredients to start new companies.

After startup, you have to have the three dynamic structures—research and development, manufacturing, and sales and marketing. In Silicon Valley, the three ingredients to start new companies are available, but many startup companies grow to a certain extent, then often they are acquired by large corporations, or they cannot grow in certain areas.

There is no person who is almighty in everything. That can be applied to countries too. In this area, no engineers are really interested in working on the factory floor. They're all interested in going into design. But in Japan, the best students in engineering departments are willing to start work as floor engineers, to increase productivity and such things. So it seems to me that many engineering students in the US cannot contribute to strengthen US manufacturing abilities.

And also the salaries paid to engineers here are lower than those paid to MBAs. This is not true in Japan.

Maybe the United States is interested in changing that kind of thing and strengthening US manufacturing capability in the long range, but it's difficult to change it instantly. The best way is to combine the best parts of both worlds—the entrepreneur spirit and venture capital in the US, but after establishing the company here, maybe keeping the research and development in the United States is better for attracting good people, but manufacturing and product development is something Japan might be better for than the United States.

This is limited to the very complicated electronic devices only. With less-complicated products, manufacturing might be optimized in developing companies. By combining the best part of both worlds from the startup stage, we are able to maximize the growth of the companies.

Are there any examples of companies operating this way?

In 1981 there were no such examples, and I started my own, Geekee Fiberoptics. In that case, I had a research and development group here, a manufacturing group in Japan, and a product development group in Japan too. The manufacturing group was in Korea. It was very successful—we operated that company for two years; I wanted to do an experiment before I started my venture capital firm here. We invented a fiber optic medical sensor that measures the carbon dioxide and hydrogen and oxygen gas pressure in blood.

For people thinking of selling high tech products in the Japanese market, what differences should they be aware of?

For anything that involves hardware in high technology, Japan is a much more quality-concerned country. Quality control is very important. In the software area, in telecommunication software systems and biotechnology, the United States is much more advanced. But in the hardware areas, it's very easy to get caught up by Japanese competitors, and it's really difficult to protect your hardware design by patent.

From my business experience here, it seems that Japanese large corporations are more security-oriented, and anybody in the company is not interested in taking risks. And also they usually require consensus-based decision making. A company that has inexpensive, excellent, and on-delivery type product that is easily accepted by a US company will find that it cannot easily be accepted by a Japanese company, because they are so concerned about the size and history of the US company.

So if you're an American startup, how do you deal with that situation?

With education for both sides.

US companies, even when they are small, are very confident in their technical competence, but they

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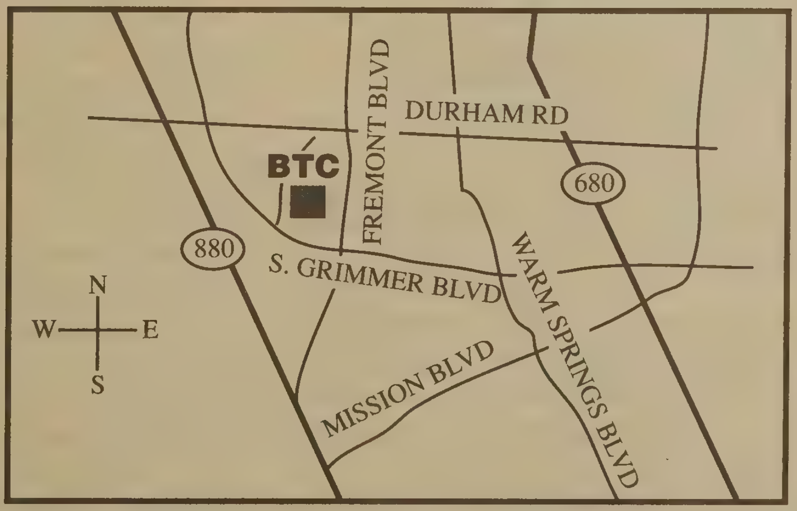

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are not concerned about size or history. The Japanese large corporation is very concerned about history, size, sales, profitability. Sometimes the age of the president is important. So we have to tell both sides the differences of values in each country, and try to help them understand.

On the Japanese side, consensus-based decision making is usual. If the US company has a good contact in the States, the information-gathering office of the Japanese manufacturing companies in the States come to the US smaller companies and get excited about the US product, the US companies think optimistically. They expect what would happen in the US companies to happen in the Japanese company, but it never happens, because information is given to the Japanese companies, and starts from the bottom. And if the technology is complicated, it's diversified into various areas. So in the case of medical electronics, both the medical division and the electronics division have to have a consensus-based decision in trading companies.

And while the decision-making process is developed in the Japanese companies, ususally there is not too much communication. The decision process is not disclosed to the US counterpart, and the US company feels very isolated and neglected, and gets frustrated. Sometimes US companies start to send very strong letters to the Japanese party, and that makes the Japanese party angry. [Laughs]

So they very often come apart because of differences in business practice. Education for both parties is really important.

With US small companies, the quality of the company might be better than the big companies in the States in terms of education level and those kinds of things. But in Japan, usually small companies are considered second-rate—when Genentech was very small, many Japanese large-corporation pharmaceutical companies were not able to believe that such a small company with less than 100 employees could do what a large Japanese pharmaceutical company could not do. It can be said of electronics and software companies, too.

In creative areas, consensus-based development research cannot work. It doesn't work. That is not understood well by large Japanese corporations.

What companies are you involved with as a venture capitalist?

Companies like the Santa Cruz Operation and the Wollongong Group, mostly system-level software companies. I usually start investment at an early stage and help them as a director of the company. It takes five to eight years, I think, to go public, but I'm really interested in the development process of those companies. With my background of overseas activities, I try to help them create a strategic alliance through my personal contacts if they need to have a strategic alliance with a European or Japanese company.

How did you become involved with Borland?

I'm a member of the board of Borland. I think the president, Philippe Kahn, would like to have his companies be globalized companies. He wanted to have optimized representation of the various nationalities—United States, European countries, and Japan. I was formally appointed to the board April 1 of this year.

He is thinking to become the most successful application software company for PCs after Microsoft, not just in the United States but in Japan and the European countries. His company has a great chance in the database market, for instance. So he wanted to create the strategies to develop the Japanese marketplace very correctly from the beginning, after seeing some of the previous examples, such as Apple and other companies.

I really hope Apple Computer is going to succeed in Japan, but as long as US headquarters keeps their policies inconsistent and doesn't support its distributors and resellers, and makes decisions without consulting its distributors, they may lose their credibility. Not from the end-user, but from their distributors. Since the local president is supposed to know the best way to optimize a market, he should be given more authority to make decisions, even to go against the US headquarters without being fired.

Mr. Kahn expects me to give a lot of advice in the development of the Japanese marketplace, and the creation of strategic alliances with Japanese hardware and software computer companies, and some additional advice about his activities in the United States, especially the margin acquisition field, which I specialize in.

What sort of products is the Japanese market particularly interested in?

Anything that is software. Software which doesn't have the character difference. Word processors are different in English and Japanese, so simple localization and porting doesn't work, you have to change all the logic.

But graphics and operating systems, communications, networks—these are all very advanced in the United States, because the entire US environment allows the single individual to invent new ideas. But in Japan, such a genius individual is not usually well accepted by the organizations. It's a very creative field, and that is not the outcome of consensus-based creativity. It's a single-man creativity, and in this field the US is much more advanced.

These kinds of products are missing in Japan.

Do you see this as a long-term situation? I read periodically that the Japanese are very aware of this creativity gap and trying to address the problem.

Many large corporations have started to be aware of very interesting things. They send young engineers to study American institutions. They wear ties and suits in Japan, but they wear jeans and start to have their own individual creativity again in the US environment. But when they go back to Japan, the creativity they developed in the States is killed in their organizations.

Some Japanese companies—although they cannot allow individualism in their companies in Japan, because it destroys the entire organization—are starting to establish central research facilities in the States, filled with lots of American researchers. They bring Japanese young people and have them develop their creative ideas. It's starting to work. So any creative Japanese people should come to the States. I don't think the corporate culture of large Japanese corporations helps creativity.

> **"If you take out the portfolio of Japanese venture capital companies, it's all medium-sized companies with long histories, 10-20 years, not growing fast, but with little chance to go out of business."**

Although many American papers write that the Japanese are missing creativity, I don't think that's right. Because if you interview Japanese people, they show a lot of creativity at the individual level. But in the large corporations, if they are interested in being promoted, they should not show their creativity or uniqueness, because being different is not appreciated in Japan. Although many people in Japan write about the importance of creativity and uniqueness, that is just words. If anyone actually starts to show creativity or uniqueness in the organizations, they are immediately, I think, put off the mainstream of the promotion line and labeled weird persons and demoted.

So while they are trying to hide their creativity in the large organization as they're trying to get promoted, many originally creative people just lose their creativity. Only well-rounded average people have a chance to be appointed members of the board of directors.

For instance, if you interview the branch managers of large Japanese banks, you'll find lots of interesting people. But these people never go back to headquarters. They are sent to the subsidiaries or customer companies. Only people who hide their creativity are called to go back to headquarters and promoted. If you interviewed the top executives of large Japanese financial institutions, I'm sure you could not find any interesting people.

Out in the Valley you hear a lot of people griping that the Japanese are taking over anyway, and why should we sell our technology to them? Do you encounter this attitude, and does it cause you problems?

Although politicians say so, actually when I interview many US entrepreneurs, they do not think so. Most of the American entrepreneurs are worried about being acquired in a hostile takeover. An entrepreneur's goal is rather more long-term than it is for finance-background people. So if US investors are involved in high technology companies, before the entrepreneur has accomplished a certain goal, US investors tend to sell the company to other companies.

If we take a close look at the US economy—the mergers and hostile acquisitions and leveraged buyouts—these kinds of things are really destroying

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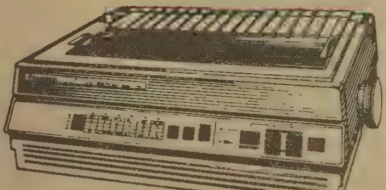

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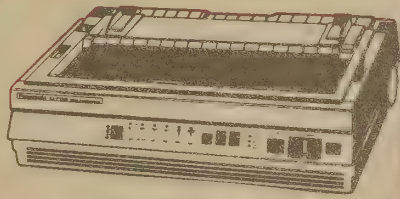

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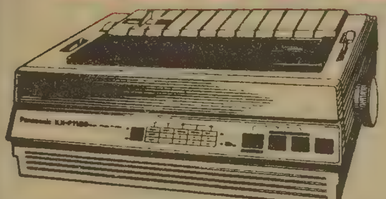

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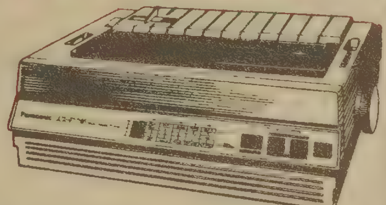

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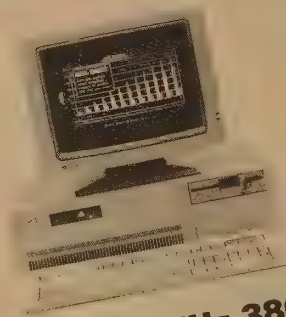

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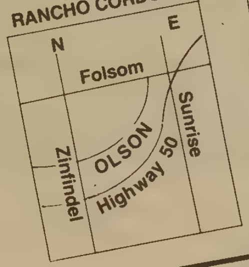

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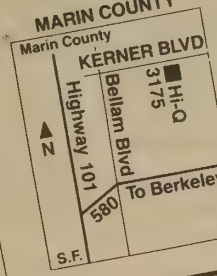

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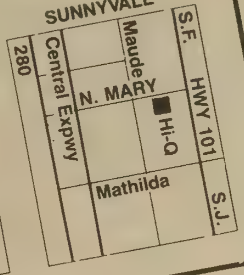

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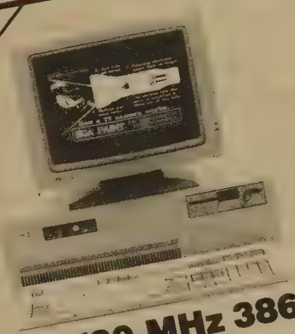

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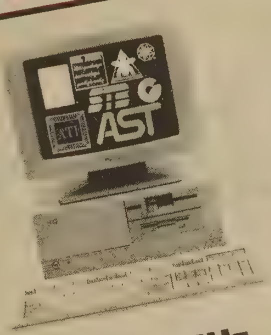

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the potential of US engineering strength that is usually nourished by the small companies. MBAs try to calculate everything, but a number of good things cannot be converted to numbers. Creativity on the engineering side is more advanced in the US, but in business and finance I don't think the US system is good.

US entrepreneurs are really looking for long-term, stable capital from investors, but now, even from US institutional investors, it's very difficult. But with Japanese investors, it's easy—they don't care so much about financial performance. As long as the entrepreneur shows a certain goal in five years, they don't worry so much about profitability in the process. And it helps.

US venture capital is important to start companies, but after the second or third round of financing, instead of taking money from US institutional investors, maybe the company is better off having Japanese long-term institutional investors as stockholders.

There's a lot of political grandstanding around the issue of US/Japan trade, on both sides. How much does that get in the way?

When US companies think the channels to the Japanese marketplace are closed, they get frustrated, especially when they have the common experience of trying different paths and not being able to get into the Japanese marketplace. So they naturally complain to their congressman or industry associations. Many congressmen are really anti-Japan. When I came to the States ten years ago, most people weren't even aware that Japan existed. But now they emotionally think that Japan is a threat, without thinking about reasons. In order to get votes from them, I think more congressmen are more provocative.

The major parties, both in Japan and the United States, are politicians. If they admit the other party's request, they lose in their district, even though they might think the other party is right. Therefore there is no incentive for the politicians of both countries to solve the problem.

I interviewed the companies in the middle, the venture companies and the congressmen and the government, and reached a hypothetical idea to solve those problems. The major reason US ventures complain to the congressmen is that they want to do business in Japan. They want to create a strategic alliance with Japan. They want to sell products in Japan. They want investors in Japan. If this can be done smoothly by infrastructures, their complaint is going to be alleviated—by eliminating all the inefficient ineffective intermediaries, by bringing the entrepreneurs to the Alliance conference and providing for them to meet real key decision-makers of the large Japanese corporations.

These key decision-makers are not usually easily identified by the US entrepreneurs. Because of the seniority society, title doesn't mean real power—lots of the presidents are figureheads. In the States, in a meeting between president and president, they make decisions. But if the US president meets a Japanese president, the Japanese president cannot make a decision. There are some US-type presidents, too, but not many.

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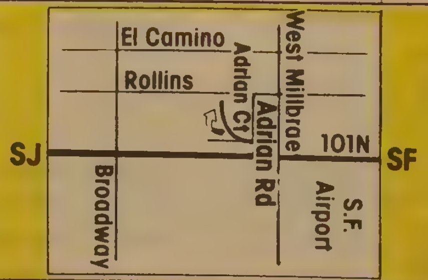

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makers, and the president of small and medium-sized companies to the conference, and provide the opportunity for both parties to talk about the possibility of creating strategic alliances. It eliminates lots of steps.

So by creating the new infrastructures to connect between US ventures and the Japanese companies, I think we can solve a lot of the potential problems that a US company may have in the future. In the past, the US and Japan had lots of conflicts in trade, such as a textile war, or steel or automobiles. But they say that in the 1990s and the next century the conflicts in the high technology field will be the most severe, because the country which has leadership in information science takes the lead in the world.

Since Russia is no longer the enemy, I am really worried that Japan will be labeled as a potential enemy. Next year is the 50th anniversary of Pearl Harbor, and many congressmen are really interested in that issue. The United States is a country which is composed of various nationalities, and Japan is so different at this point.

The people on the West Coast know many Japanese, and some have been to Japan, but still lots of American people who criticize Japan do not have any friends in Japan, and do not know anything about Japan, but still they have voting power and choose the politicians.

Japan has to position itself as a nation to contribute to the world. That is one reason I'm spending a lot of time helping development projects in Japan, because as long as Japan is labeled a closed nation, it's a very easy target to attack.

To change the politicians' mind is very difficult. But by creating thousands of strategic alliances between US business and Japanese business, and mixing the economic interests, entangling them—that's also another way to stabilize economic and political conditions. That is a grassroots-type activity, so it takes a longer time, but I believe it is much more effective than just creating treaties between US and Japanese governments that can be changed overnight.

In terms of politicians, both countries are capitalistic countries and business has a really strong power over the politicians. The chairmen of lots of fundraising committees are business people. If those people have a very strong interest in the opposite countries, they may prevent the politicians from saying extreme things.

There is no reflection of the Japanese end-user's voice here. For instance, the rice imports or citrus imports—most Japanese people, including myself, want imports of those products from the United States, and some food such as beef. The import quota from the States was enlarged a couple of years ago, and consumers really welcome such decisions. But because of the long tradition of relationships between Japanese industry and politicians, it's very difficult to change internally. Pressure from the US government on the Japanese government is supported by Japanese consumers and end-users. We are not as interested in protection as the Japanese government.

By combining the efficiency of every country, I think the world can be more prosperous, combining the strengths of each country. (DEFTA/Data Control Ltd., 415/873-6791; Fax 415/873-6794.) ■

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Venture Capital

A Survey Of Venture Capital Firms

By Michael Robin

"Everyone is being a lot more selective about what they invest in."

—Jeff Booth
J.H. Whitney & Co.

"There has been an overall reduction in the number of early stage investments, period."

—Lucien Ruby
Continental Capital & Quest Ventures

We asked representatives of six venture capital firms what changes they've been seeing in the microcomputer industry, and about how those changes have affected their activities as investors. Each spoke candidly about the state of the investment community, the mistakes of the past, and where they're currently looking for new and exciting investments.

Paul Dali
3i Ventures

3000 Sand Hill Rd.
Building 3, Suite 105
Menlo Park, CA 94025
(415)854-3330

What changes, if any, have you seen in the computer industry?
There is still plenty of money available, but we are seeing a consolidation of products. Typically, in venture capital, once you invest in a company, the company is doing well, and it needs more money, you invest your pro rata share in subsequent rounds. If a guy does not, when the company isn't performing well he begins running out of money—in about two deals out of ten that's the case. So we're picking our partners a lot more carefully.

Venture economics says that 17 to 18 percent of the funds are looking for money at any given time. That's 125 to 150 companies out of maybe 600, at any given time, looking for money—and they're having a harder and harder time raising it, not because the money isn't available, but because of the performance of the deals that venture capital funds.

What has been the impact of these changes on your work?
We are looking more carefully at who we are co-investing with. 3i is at a great advantage because we are an evergreen fund. Because we are the biggest venture firm in the world, we have a great deal of money. So we make a very attractive partner to the other firms. Conversely, we are now being more careful of the firms we invest with to make sure they have enough power and staying ability with cash to be able to foot the company correctly.

What type of companies are you looking at?
3i likes to look at healthcare or electronics deals. We have four partners in the US that are doing healthcare deals, six partners doing electronics deals.

Multimedia is an emerging market. We're not exactly sure what it is. But we do know it is a technology that should be carefully catered to. There's an underground wave that you don't see right now. If you are a consumer or a marketing professional in a company, you don't know the wave is going on, but in a couple of years, all of a sudden, you'll see all these new products.

When considering a company, what are you looking for?
You have to follow two tracks: either great management or great product. Generally, many venture capitalists love to follow technology and know that because of their background, credibility and network, they can help a masterpiece. Other guys say, "Hey, give me great management and I can make a mediocre product successful."

But you have got to have a market. When you look

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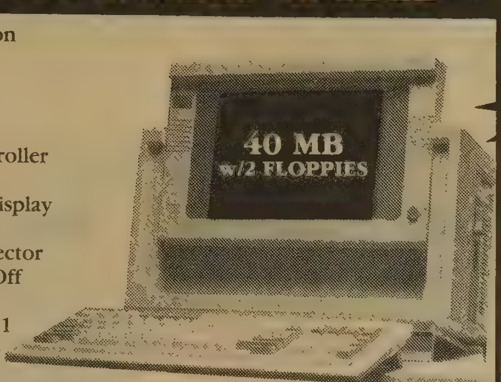

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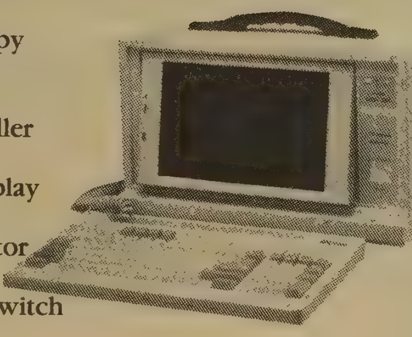
286-12 MHz	$1675
386SX	1955
386-25 MHz	2225
386-25 MHz w/32K CACHE	2425
Optional EGA & VGA	$599

(640x480 Pixel Graphic Display, 800x600 Pixel Graphic On Ext VGA or Multisync)

LCD PORTABLE w/40 MB HARD DISK



- 640x400 Resolution
- 1 MB RAM
- 1.2 or 1.44 MB Floppy Drive
- 40 MB Hard Disk
- Hard/Floppy Controller
- 2 S/1 P/1 G
- HGC/CGA/MDA Display Modes
- Ext Monitor/Connector
- Contrast Ratio: 6:1
- 110/220V AC Auto Switch
- Carrying Bag

286-12 MHz	$1395
386SX	1650
386-25 MHz	1995
386-25 MHz w/32K CACHE	2150
Optional EGA Display	349

CITIZEN:

GSX 140	$285
Color Option	59
GSX 1124	295
GSX 1524	395
WINDOWS 3.0	99

PRINTERS:

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KXP1180	$175
KXP1124	285
KXP1624	445

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Mouse (Bus)	$79
Mouse (C9)	69
Trackman (Bus)	93
Trackman (Serial)	87
Scanner	175

MODEMS:

2400 Ext	$115
2400 Int	95
1200 Ext	70
1200 Int	55

486 SYSTEM w/100 MB, 4 MB RAM SUPER VGA

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386 SYSTEM w/100 MB, 1 MB RAM SUPER VGA

386-33 MHz w/64K CACHE ON BOARD

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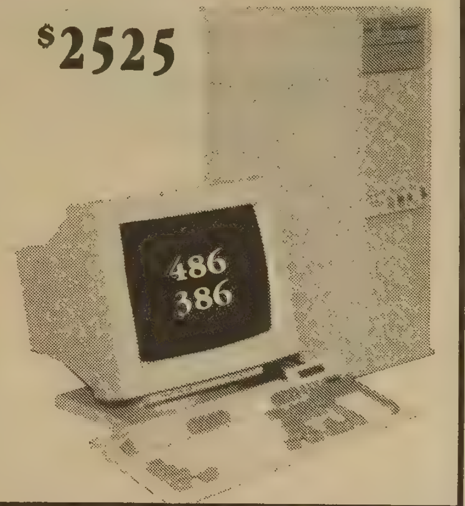

Standard Equipment:
- (486) 4 MB RAM Exp to 16 MB
- (386) 1 MB RAM Exp to 16 MB
- 100 MB Hard Disk 18ms
- Dual Floppy Drives (1.2 & 1.44 MB)
- 1:1 HD/FD Controller
- VGA Card 1024x768 w/512K
- 2 S/1 P/1 G Ports
- 230 W Power Supply
- Upright Case

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386 w/DUAL FLOPPY & 40 MB

	MONO	MONO VGA	VGA
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25 MHz w/32K Cache	1640	1750	1955
25 MHz w/o Cache	1415	1525	1730
SX-16 MHz	1135	1245	1450

- 1 MB RAM Exp to 8 MB or 16 MB
- 40 MB Hard Disk 25ms
- 1.2 Floppy Drive Teac
- 1.44 Floppy Drive Teac
- 1:1 Interleave Controller
- MONO or VGA Monitor
- MGP or 16 Bit VGA Card (Video Seven)
- 101 Key Focus Click Keyboard w/Cover
- 2 S/1 P/1 G
- 200 W Power Supply
- Baby AT Case or Mini Upright
- Supports DOS, OS/2, UNIX, XENIX

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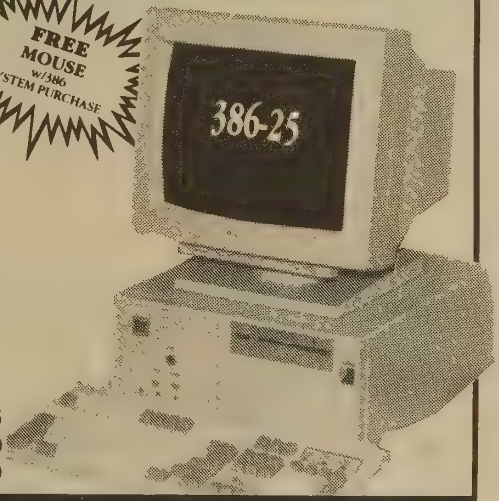

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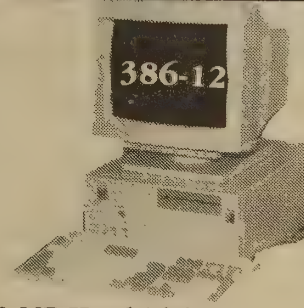
60 MB	+95
80 MB	+250
100 MB	+338

VIDEO OPTION

14″ Mono	+35
VGA: 800x600	+50
1024x768 w/512K	+100

286-12 MHz w/40 MB MONO/VGA . . . $875/1152

- 1 MB RAM Exp to 4 MB
- 40 MB Hard Disk 25ms
- 1.2 or 1.44 MB Floppy Drive Teac
- 1:1 Interleave Controller
- MONO or VGA Monitor
- MGP or 16 Bit VGA Card
- 101 Keyboard Focus Click Keyboard w/Cover
- 2 S/1 P/1 G or 2 S/2 P
- 200 W Power Supply
- Baby AT Case or Mini Upright



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$1149 386-25 MHz 64K Cache

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- 64K Static Cache Memory
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- 1:1 Interleave HD/FD Controller
- Socket for 80387
- 2 Serial, 1 Parallel, 1 Game Port
- 230 W Power Supply
- 101 Enhanced Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

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Super VGA Monitor & Card (1024x768 0.28)	485

286-20 MHz 0 Wait

- Landmark=26.5
- 512K Expandable to 8 MB
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- Shadow RAM for fast BIOS Access
- EMS LIM 4.0 Built-in
- Page Interleaved Memory
- 1:1 HD/FD Controller
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286-16 MHz 0 Wait

- Landmark =21
- 512K Expandable to 4 MB
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DTK 8088 10 MHz	$69
286 6/12 MHz 0 Wait	135
286 8/16 MHz 0 Wait	210
286 8/20 MHz 0 Wait	295
386SX-16 MHz 0 Wait	335
386-20 MHz 0 Wait (w/o CPU)	295
386-25 MHz 0 Wait (w/o CPU)	335
386-25 MHz 64K Cache (w/o CPU)	430
386-33 MHz 64K Cache (w/o CPU)	530

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ST-225 (20 MB)	$185
ST-225 Kit	225
ST-238 Kit (30 MB)	255
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ST-4096 (80 MB, 28 MS)	545
ST-296N (SCSI 80 MB, 28 MS)	479
Toshiba 134FA (44/66 MB, 24 MS)	320
NEC 3142 (44/66 MB, 24 MS)	320
Conner 80 MB	510
Conner 100 MB	575
Conner 200 MB	895
Maxtor 4170E ESDI 150 MB, 14 MS	925
Maxtor 4380E ESDI 320 MB, 16 MS	1450
Maxtor 8760E ESDI 660 MB, 16 MS	2290
CDC SCSI 150 MB, 18 MS	850
Miniscribe 330 MB SCSI	1149
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- 1.2 or 1.44 MB Floppy Drive
- 230 W Power Supply
- 101 Enhanced Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

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386-SX 20 MHz

- Landmark=26.5
- 1 MB Expandable to 8 MB
- Chip & Tech. NEAT Chip Set
- EMS LIM 4.0 Built-In On Board
- Shadow RAM
- Page Interleaved Memory
- 1:1 HD/FD Controller
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- 2 Serial, 1 Parallel Port
- 230 W Power Supply
- 101 Enhanced Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

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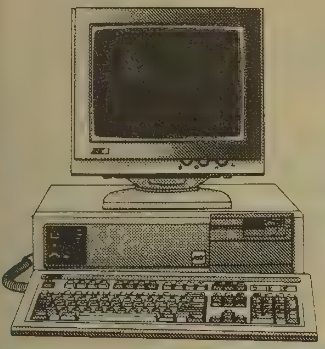
386-SX 16 MHz

- Landmark=23.5
- 1 MB Expandable to 8 MB
- Chip & Tech. NEAT Chip Set
- EMS LIM 4.0 Built-In On Board
- Shadow RAM, Page Interleaved
- 2 Serial, 1 Parallel Port
- 1:1 Interleave HD/FD Controller
- 1.2 or 1.44 MB Floppy Drive
- 80387-SX Socket
- 230 W Power Supply
- 101 Enhanced Keyboard
- Supports MS-DOS, OS/2, Unix, Xenix

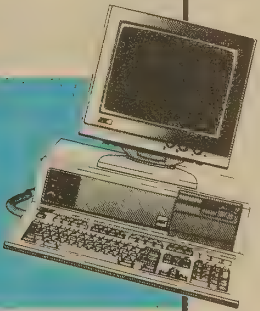
\$429

286-12 MHz 0 Wait

- 6/12 MHz 0 Wait
- EMS LIM 4.0 Built-in On-Board
- 512K Expandable to 4 MB
- Landmark=16
- 1:1 HD/FD Controller
- Real Time clock
- 1.2 or 1.44 MB Floppy Drive
- 230 W Power Supply
- 101 Enhanced Keyboard



20 MB Hard Disk	\$175	80 MB 24MS	\$495
40 MB 28MS Hard Disk	270	100 MB 24MS	\$575
65 MB 24MS Hard Disk (NEC or Toshiba)	335	150 MB.	799
		200 MB 16MS	\$895
		330 MB 16MS	1099



Modem

Everex 1200 Baud (Int)	\$55
Everex 2400 Baud (Int)	115
Everex 2400 Baud (Int MNP5)	150
Everex Fax Modem (9600 Fax, 2400 Modem, MNP5)	255
2400 Baud (Int)	85
2400 Baud (Ext)	99

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Mitsumi 84 Key	\$35
Mitsumi 101 Key	39
Keytronic 101 Key	49
Maxiswitch 101 Key	49

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Star NX-1000 II	165
Star NX-1000 Color	215
Panasonic KX-P 1180	165
Panasonic KX-P 1124	289
Panasonic KX-P 1624	375

Misc.

287-8/10	\$185/210
387-16/20	315/355
387-25/33	445/540
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230W Power Supply	48
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Hyundai VGA	310
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Relisys Multisync	425
NEC Multisync 2A	470
NEC Multisync 3D	615
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DTC 7287 1:1 FDC/HDC (RLL)	95
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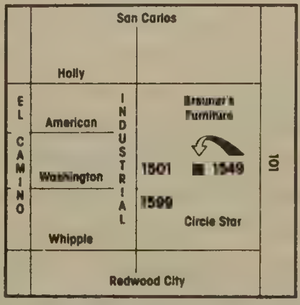

at a product, there must be a compelling reason to buy this product—that it is not just an evolutionary add-on to an existing product. That's difficult to check. If you don't have a pretty good-sized market and a compelling reason to buy the product, what do you have?

What distinguishes your firm from other venture capital firms?

There are basically three reasons. First, we're all operating partners in 3i, and still like very early stage companies. Where a lot of other venture firms are moving to later stage to accept less risk and put out more money, we still like early stage. One of the things we compensate for by looking at these companies is that we have really good operating experience. We understand how to make companies grow and how to deal with management and give them the best advice.

Second is position operating value. Presuming the company is doing well, you know that, since we don't have limited partners and don't have to raise money every three or four years, you can rely on us to be your partner in an investment.

And the third reason, we are international. As we [expand] more globally and become more global in our marketing, 3i will be able to help these companies. I think those three things really give us some differentiation over a lot of the other funds.

Networking For Entrepreneurs— The Pacific Venture Club

By Mary Eisenhart

Entrepreneurs in search of contacts, for purposes ranging from venture capital to management candidates to brainstorming sessions, will find a unique resource in the Pacific Venture Club. The club recently changed its name from the Bay Area Venture Capital Club as it expanded its operation statewide.

The brainchild of Robert Coleman and Michael Chin, the organization holds bimonthly events at which entrepreneurs present their companies to audiences consisting of potential investors (both private and institutional) and other interested parties. While there's a strong technological presence at these gatherings, the meeting I attended recently also included presentations by a child-care company seeking to expand its operations and a T-shirt franchise operator. Most presenters at that meeting appeared to represent established businesses, but the forum also functions as an informational resource for startups in search of viability.

The Pacific Venture Club is not a venture capital firm, but an educational forum and networking resource for the entrepreneurial community. Strict rules govern the nature of the presentations, and Coleman and Chin unceremoniously interrupt any speaker who gets carried away and veers into the forbidden territory of Offering Or Encouraging The Offering Of Securities. Meetings are held bimonthly, usually on Saturday mornings in the Bay Area; call for further information for activities in other areas. (Pacific Venture Club, 3020 Bridgeway Suite 417, Sausalito, CA 94965, 415/331-3836.)

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What changes, if any, have you seen in the computer industry?

The price of hardware. Processing power is getting so cheap and becoming commodity-like.

What has been the impact of this on your work?

That makes it a less attractive opportunity for venture investment. To do something that's hardware-related, it's likely to be something that enhances the basic functionality of the system.

Does that mean you are looking more at software?

Actually, we have done more software in the last couple years versus hardware. Not that we haven't done any hardware, but we have done more software.

When considering a company, what are you looking for?

We are early stage investors. We tend to invest in companies that either are in the process of developing their product or have it for sale, but it has only been for sale for a limited amount of time.

What we're looking for in an investment would be the ideal: (1) very good management; (2) a competitive advantage that is usually in the product—but it doesn't necessarily have to be, sometimes it's in the market or distribution channel; and, (3) the opportunity to build a reasonable-size company. Since we work in the early stages, "reasonable size" is going to mean at least $15 to $20 million plus. The last thing is that there is an opportunity for shareholder liquidity. Since the company has an infinite life, but the funds that venture firms manage have a finite life, there has to be an opportunity either for the company to go public, be acquired or merge.

What distinguishes your company from other venture capital firms?

We have fifteen investment professionals—we are large in our number of people. Also we manage $450 million in capital. There are other large funds, but there are fewer large funds than small funds. We are focused on three broad industry areas: electronics, or technology, medical funds and communications. We also have very strong international ties both in Asia and in Europe.

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What changes, if any, have you seen in the computer industry?

The obvious one is that people don't fund a lot of hardware any more. People are beginning to evaluate more closely the software opportunities, especially with the advent of Presentation Manager, OS/2 and Windows 3.0. Venture capital firms are feeling the opportunity to get on to new platforms and create new opportunities for themselves.

What has been the impact of this on your work?

I am looking more at PC software opportunity.

When considering a company, what are you looking for?

You are always looking for suitable market opportunity and good team. People bringing something unique to the table so they can gain market share. Those parameters never change. In the computer industry there are new platforms, so there are new opportunities to get into markets that don't exist yet.

What distinguishes your company from other venture capital firms?

Our representation in business has been being very good with early stage companies. Getting in there, rolling our sleeves up and working with the company.

In the last few years a lot of venture firms have moved toward the later stage of investing, even so far as to get involved in buyouts. Even if things look attractive in that part of the market, we won't do

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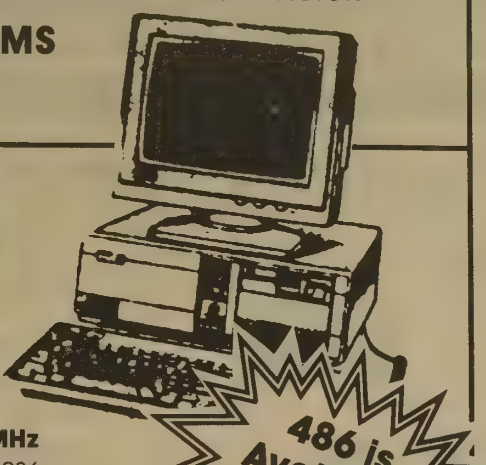

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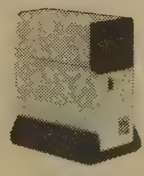

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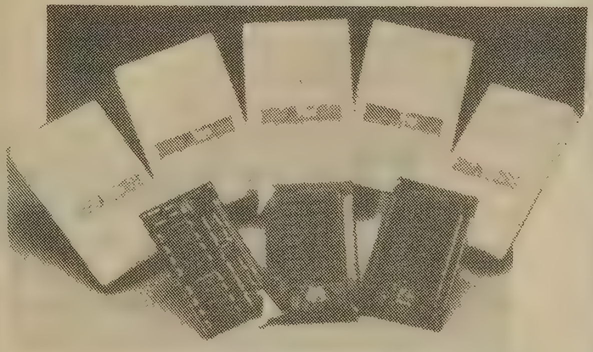

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- 1.2 Teac Drive
- AT Power Supply & Case
- 101 Keyboard

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- 1 MB
- W.D. 1:1 Controller
- 1.2 MB Teac Drive
- AT Power Supply & Case
- 101 Keyboard

$1795

MICRONICS 386 SYSTEM

386-25 Cache

- 1 MB (up to 8 MB)
- W.D. 1:1 Controller
- 1.2 MB Teac Drive
- AT Power Supply & Case
- 101 Keyboard

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- 1.2 Teac Drive
- AT Power Supply & Case
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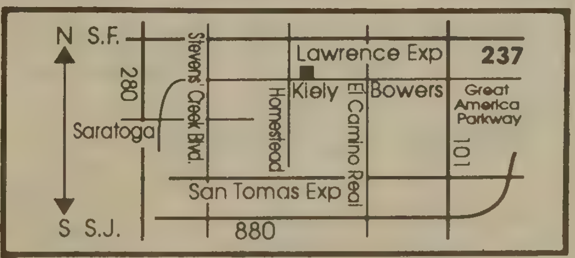

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4 MB	395
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HPGL™ EMULATION FOR LASER PRINTERS

High Resolution Graphics in a Fraction of the Time Required by Pen Plotters

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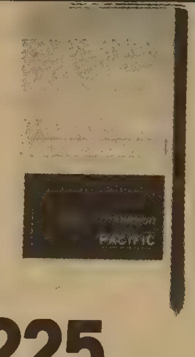

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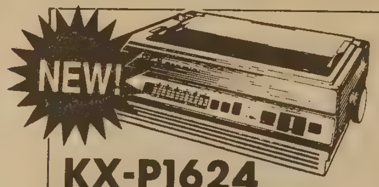

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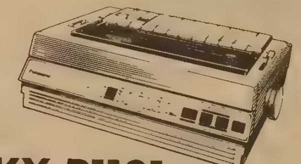
Wide Carriage, 24 Pin Dot Matrix Printer with Many High End Printer Features

- EZ set operator panel controls more than 20 functions
- Paper parking
- Rear, bottom, front and top feed
- 360x360 dpi resolution
- Multiple font capabilities -2 draft and 5 letter quality

BEST PRICE



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- 240 cps, 48 cps NLQ
- Combines over 4600 type styles
- 240x216 dpi resolution
- Paper park
- Adjustable push/pull tractor
- 11 7" carriage
- 2 year warranty

BEST PRICE

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- "EZ-Set" front panel controls over 11 functions
- 192 cps, 38 cps NLQ
- 4 resident NLQ & 2 draft Fonts
- Combines over 3400 type styles
- 240x216 dpi resolution
- Paper park
- Adjustable push/pull tractor
- 11 7" carriage
- 2 year warranty

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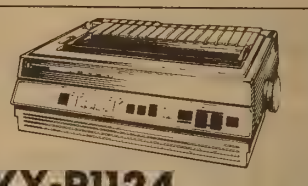

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- 192 cps, 63 cps NLQ
- 5 resident LQ Fonts
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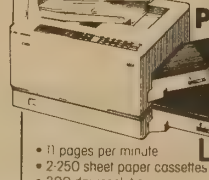
- Rear, bottom, front feed paper paths
- 360x360 dpi resolution
- 2 year warranty

BEST PRICE



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- 2-250 sheet paper cassettes
- 300 dpi resolution
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- Front panel controls

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Drummer	145
Envelope Tray	59
Developer	95

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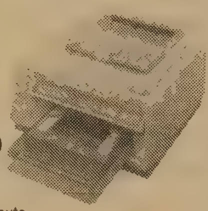

- 8 Pages Per Minute
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- 22 Resident Fonts
- HP Series II Compatible

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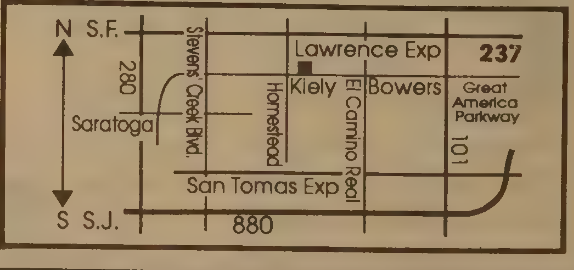

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80387-20/25/33 MHz	**349/445/555**

ITT MATH CO-PROCESSOR

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3C87-20/25/33	**349/445/555**

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4420 w/Cable	**879**
4450 w/Cable	**1299**

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All VGA Cards Come 1024x768

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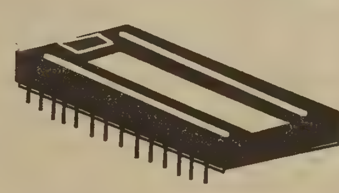

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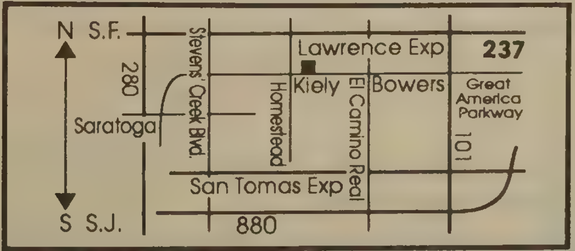

them. That's not what we know how to do.

That creates opportunity for us down the road. There are not as many people playing in this segment of the market, so supply and demand plays in our favor.

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What changes, if any, have you seen in the computer industry?

The biggest change has been the dramatic drop in the price of hardware. It is getting harder and harder to build large corporations. We are looking at being able to build large companies. So where we invested in some microcomputer companies early on—we were original investors in Compaq computers—in the last four years we have not invested in any microcomputer companies.

What has been the impact of these changes on your work?

Everyone is being a lot more selective about what they invest in.

What type of firms are you looking at?

There are two sides of the industry—hardware and software. We have not been able to figure out the formula for success for software. Nor do we see being able to build the next Lotus, Ashton-Tate or Microsoft. You are seeing a lot of interesting stuff out there, but it is usually a hard push to see them making it to $20 million a year in revenues. As a result we have not been investing in them.

We invest in two types of companies. One is early stage startup; the other is leveraged buyouts of medium sized companies—fifteen- to a couple-hundred-million-dollar companies. More of our dollar volume tends to go to leveraged buyouts. But to get the returns we want, we don't see being able to get those returns unless we are invested in the very early rounds of a deal. So we do look for early stage, or first round, startups.

What do you want from the companies you look at?

We are very technically oriented. We want to see a proprietary technology, coupled with a good management team and an opportunity to get a substantial franchise within the market.

What has made itself clear is that in any deal there has to be a compatible team of management and investors. Investors have to be compatible within themselves, and have to be compatible with the management team. If that isn't there, no matter how good everything else is, it spells trouble down the road.

What distinguishes your firm from other venture capital firms?

We claim to be the first venture capital firm in the United States, to have coined the term venture capital, funded in 1946. Until very recently we had been a private venture capital company. That has made our perspective and the way we operate internally quite different from other venture funds. We're investing our own money and have to get a return on it that will allow the whole partnership to survive, as opposed to going back out to raise more money to invest from someone else.

Lucien Ruby
Continental Capital & Quest Ventures

555 California St.
Suite 4960
San Francisco, CA 94104
(415)989-2020

What changes, if any, have you seen in the computer industry?

People are still feeling a legacy of the disk drive phenomenon of the early '80s. They don't really seem interested in investing in things that can't be proven to be revolutionary or much greater than an incremental betterment of what's already out there. Every meeting I've been in in the last three or four years, where people are talking about investing in hardware, everybody says, "Is this just another disk drive?"

More people are looking at software, but they are probably making less investment than before. The investments in seed and early stage computer-based companies have declined dramatically in the last four or five years. There has been an overall reduction in the number of early stage investments, period. In the computer business, it is even more dramatic than what the overall tendency has been. People are investing in later stage things. A good example of that is the follow-on investments in Stellar and Ardent—to keep that alive and merge them.

While the venture industry has changed from about $5 billion under management to about $20 billion under management, the absolute number of early stage investments has remained pretty much constant. Therefore, the percentage in terms of the number of deals, and certainly in terms of dollars allocated, has declined dramatically.

What has been the impact of these changes on your work?

We have broadened our horizons to look in other areas. Take a look at some of the traditional technical investors down in Silicon Valley. For a while, a lot of people were actually looking at retail things. I think you'll find the percent of deals that people have seriously considered that are computer-related has probably declined. I don't know if that's because the absolute number of those has shrunk, or everyone else has broadened their vision.

What type of companies are you looking at?

We are looking at developed software that's trying to get into the marketplace. I don't think we want to fund software development. We've determined that there is absolutely zero barrier to entry for a software startup, but there's an incredible barrier to success.

A lot of guys have gone into leveraged buyouts. There are very few opportunities to do a leveraged buyout in the computer business. You can poll a lot of people around here, and they will say, "Yeah, we're expanding our horizons to do other things, not only to just other technologies but other markets." That means that they are changing their business strategy to do buyouts and turnarounds. It's sort of like a jump shift. They are not only changing the focus of what kinds of things they will look at (i.e., what markets and what technologies), but they are also changing the stage of things they are looking at.

What do you want from companies?

We want somebody who is credible in the particular arena they hope to get involved in. We'll help put the rest of it together. We want somebody to come to us with an idea where the answer to the following question is affirmative: If they're successful with what they want to do, will anyone care? We want to find somebody doing the right thing rather than somebody who will end up doing the wrong thing but very well. And that's totally just a market question.

What distinguishes your company from other venture capital firms?

We really will look at guys with just an idea. We don't have to have a business plan, a full management team, or even a prototype. We have started companies here in our office where some guy came in and said, "Hey, I got a really good idea." We made a few calls and found out that if this guy was successful, people would be interested in what he was doing and there would be a market for it. So we sat him down, and said, "Here's an empty desk and a pad of paper, come up with a business plan."

Doesn't that contradict what you said earlier about software ventures?

Yes, the problem with software is it's just like movies. You could be 99.9% finished with either a software package or a movie and still have 500% of the cost to go. That is just an area we are uncomfortable with unless it is with a really specific unique niche.

One of the worst things I ever did, years and years ago, before I started Quest Ventures, was put some money in a guy to do software development. We tried to call and found out he had decided the only place he could work effectively was in Mexico. So he had taken his computer down there. We later found out that he couldn't work down there because it was too nice.

Woodrow H. Vandever, Jr.
Applied Technology Investors, Inc.

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Cambridge, MA 02138
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What changes, if any, have you seen in the computer industry?

Information is all becoming digital. In the past, if

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- Clock/Calendar Back-Up Battery
- 101 Key Enhanced Keyboard
- **AT Case and Power Supply**

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- 1.2M or 1.44M Floppy Drive
- 2 Serial, 1 Parallel Port, 1 Game Port
- Clock/Calendar Backup Battery
- 101 Key Enhanced Keyboard
- **AT or AT Baby Case and Power Supply**

ICS 386/20 SYSTEM

LANDMARK 27

$1195

- 1 MB RAM
- **40 MB** Hard Disk .28ms
- 1.2M or 1.44M Floppy Drive
- 2 Serial, 1 Parallel Port, 1 Game Port
- Clock/Calendar Backup Battery
- 101 Key Enhanced Keyboard
- **AT or AT Baby Case and Power Supply**

ICS 386/25 SYSTEM

LANDMARK 34

$1295

- 1 MB RAM
- **40 MB** Hard Disk .28ms
- 1.2M or 1.44M Floppy Drive
- 2 Serial, 1 Parallel Port, 1 Game Port
- Clock/Calendar Backup Battery
- 101 Key Enhanced Keyboard
- **AT or AT Baby Case and Power Supply**

386/25 64K CACHE

LANDMARK 43

$1495

- 1 MB RAM
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- 1.2 or 1.44 M Floppy Drive
- 2 Serial, 1 Parallel Port, 1 Game Port
- Clock/Calendar Backup Battery
- 101 Key Enhanced Keyboard
- **AT Case and Power Supply**

386/33 64K CACHE

LANDMARK 58

$1895

- 1 MB RAM
- **100 MB** Conner Hard Disk
- 1.2M or 1.44M Floppy Drive
- 2 Serial, 1 Parallel Port, 1 Game Port
- Clock/Calendar Backup Battery
- 101 Key Enhanced Keyboard
- **AT Case and Power Supply**

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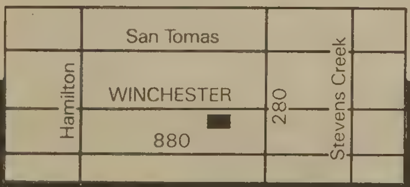

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Government Grants: An Alternative To Venture Capital

By Shoshana Tuttle

These days, when asking for help from venture capitalists often means many strings attached, Dr. V.O. Leirer of Los Altos has found an attractive alternative. He has been able to develop a product worth $25,000 per unit, has no money to pay back, and owns all rights and profits.

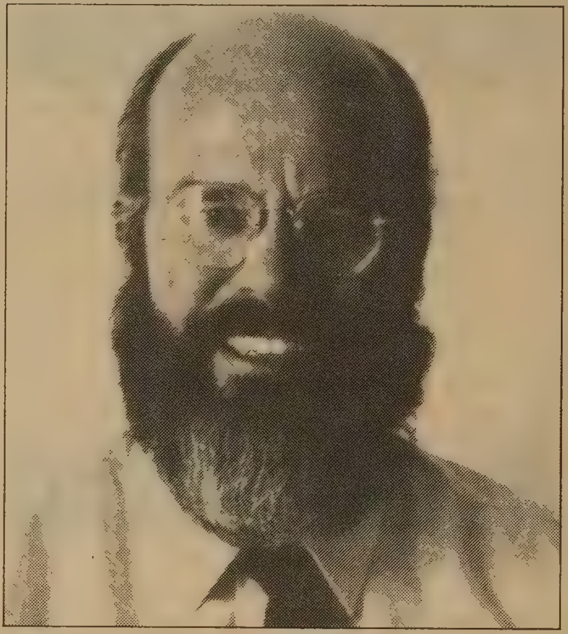
This solution comes from a somewhat improbable place: the world of government grants. Specifically, Leirer's funding was called a SBIR (Small Business Innovative Research) grant, and came from the National Institute on Aging. He notes that many other government agencies have such grants. The Department of Defense, for instance, is well-known for soliciting proposals to develop and provide needed military products.

Leirer's product is not a war toy, though, but an attempt to address the problem of elderly patients forgetting to take their medication as scheduled. He developed TeleMinder, a voicemail system that can not only call to remind patients to take their medication, but also check on the home-bound, remind the elderly of social events at senior centers, alert them to the times and locations of free influenza shots, and offer many other services.

Hospitals, clinics, doctors' offices and other health care facilities were the original intended customers for this product. Beyond this, the system is potentially useful to anyone needing to make many calls out of a large client database. Dr. Leirer's system uses a 386-based computer with a large hard disk capacity capable of handling more than 50,000 patient records, each containing up to 1,000 items of information. The phone hookup has a 4- to 16-line capacity, allowing it to make from 240 to 960 calls per hour. The cost effectiveness of the system, shown here in the number of man-hours it can save, is one of its foremost sales attractions.

How To Succeed With Government Grants

The key to Leirer's success seems to be the scale and pace of his project. He divided the research and development for the TeleMinder project into two sections, writing two proposals, and was thus able to receive two grants for one project.



Dr. V.O. Leirer adopted his research to government specs, and got two free government grants and the rights to the resulting product.

Even with the administration of the grant itself, the question of scale is also very important. The SBIR grants are divided into two phases: Phase One is a very short six-month grant; if your initial proposal is accepted, you are given up to $50,000 to allow you to determine the feasibility of the project. The government agencies scrutinize your initial proposal very carefully; the grant givers are very concerned with getting their money spent well. Also, because all this is specific to the scientific tradition, validation of the project is particularly important.

If the grant agency is satisfied with your performance during Phase One, Phase Two funding is given. This phase is for two years, and is worth up to $500,000. The purpose of this phase is to completely develop the product, and have it ready for market. It's at the end of this phase, when production costs must be met, that many grant recipients feel forced to give in and go to venture capital after all. On the other hand, Leirer says that by watching his funds carefully and getting into sales gradually, he will need no other funding than his grant.

Company size is another scale issue. Decision Systems consists of only fifteen people, divided among three research projects—ten are actively working on the TeleMinder system. These include four programmers, three marketing and sales people, two people researching the effectiveness of the system, and Leirer himself. With this efficient use of human resources, the TeleMinder system is now nearly fully developed and ready to go to market.

Many factors made Leirer an attractive grant candidate. He was known to the National Institute of Health, having received two related post-doctoral Fellowships from them in 1980 and 1981. He has also done extensive work in cognition and the human/machine interface, which he has published in well-known journals. Most compellingly, Leirer was able to present evidence of research progress on the subject even before he made his initial proposal.

Qualifying for a grant isn't easy. Aside from acquiring the right credentials, there's the requirement that your idea correspond to the need stated in the government's "request for proposal."

RESOURCES:

Office of Grant Inquiries
Division of Research Grants
Westwood Bldg., Rm. 449
National Institutes of Health
Bethesda, MD 20892
(301) 496-7441

Dr. V.O. Leirer
Decision Systems
318 State St.
Los Altos, CA 94022
(415) 949-2544

Grants vs. VC

It's worth noting that the scale of funding by venture capital is much larger than that of government grants. It's not uncommon for venture capitalists to extend several million dollars for the development of one promising product. However, the world of VC is one in which astute people make a profit when they lend money. They may even wind up having a controlling interest in the company. While government grants are smaller, many, like Leirer, feel the autonomy offered by grants more than makes the smaller scale and increased difficulty worthwhile. ■

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you spoke of the computer industry, one thought of numbers, then of text. But over the last few years you've started to see images becoming digital. Voice now comes in digital form, too. Then you get into animation and digital video.

All these various ways of transferring information have become digital and the implication is that you are getting the merging of a computer industry, a communication industry and the media industry. Where these various industries intersect, all kinds of new technologies begin to emerge, all kinds of new techniques have to start coming into existence, which in turn is the opportunity for small companies.

As information has become digital, we have become a much smaller world. From a business point of view, if you want to be in the computer industry, or communications industry, or media industry—the information industry—you have to relate to everyone in this market.

What type of companies are you funding?
In the current funds we basically went after ones which are being impacted in these arenas. It varies from traditional things, such as people who have developed new types of chips that integrate new things in them, new words like multimedia, but also the electronic image industry, electronic printing, information management.

Systems aren't totally integrated for the information interchange to take place. In telecommunication, work is being done in how one integrates the information, but also in the development of the media. It is predicated on the fact that all the various ways you communicate are connected, and have all reached a common media of digitization.

What do you want from companies?
There are a couple of levels to that. We invest in seed, or early stage companies. We tend to look at the long term future. When we do that, what we tend to look at are the things we think are the enabling technologies, things that become the underlying entities. They in turn will allow other new products to come into existence.

What distinguishes your company from other venture capital firms?
One is, we are focused. We are focused on information and publishing. We think of publishing as the act of gathering, editing, structuring, modifying, and unifying the distributing of information. Now that information has become digital, publishing starts making the information available in any given form. It becomes much more of an abstraction.

Two, the background of the people involved—they come out of the information industries, the computer industry. Given that situation, we are also focused on the early stages. We definitely have a hands-on type approach.

We also believe in the international arena. Of the people who invested in us, we also have some large corporations, two American corporations, one U.K. company, one Japanese company. Which in turn drives up the capability of helping small companies find distribution relationships. ■

We invest in seed, or early stage companies. We tend to look at the long term future. When we do that, what we tend to look at are the things we think are the enabling technologies, things that become the underlying entities. They in turn will allow other new products to come into existence.

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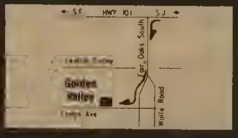

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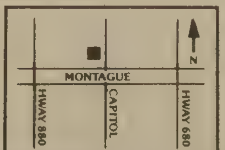

Venture Capital

Case History

Autodesk Meets The Venture Capitalist

By
John Walker

From The Autodesk File: Bits of History, Words of Experience, *edited by John Walker, copyright 1987, 1988, 1989 by Autodesk, Inc. Used by permission.* The Autodesk File *($24.95, ISBN: 0-934035-63-6) is available from New Riders Publishing, P.O. Box 4846, Thousand Oaks, CA 91360, 800/541-6789, 818/991-5393.*

Founded in 1982 by 16 people, many already veterans of other ventures, Autodesk began with $59,030 in working capital and six potential products, one of which was AutoCAD. At the end of its first fiscal year it had a net loss of $9,465 on sales of $14,733. That was its last loss. Its first public stock offering was in 1985, at $165 per share; then as now, it's the undisputed leader in PC-based CAD software.

Autodesk enjoys the relatively rare distinction of having bootstrapped itself to spectacular success without a dime of venture capital. But its founders, independent-minded as they were, occasionally toyed with the idea.

In this chapter from *The Autodesk File,* founder, former president and chairman, John Walker (whose memo on resigning the chairmanship and returning to the lab is one of the book's particular delights), offers a rare look at the inner workings of what turned out to be a very successful startup.

The Deal On The Table

After talking to virtually every venture capitalist in the business, in May of 1984 it appeared that we were finally going to close a deal. Frank Chambers, who had been introduced to us by [co-founder and financial advisor] Jack Stuppin, indicated that he was willing to make an investment in our company. Despite our cynicism, born of endless tiresome and fruitless meetings which consumed our time when it was desperately needed to develop the company, we were eager to obtain funding we could apply to increase our marketing efforts and seize the market before better-funded competitors entered the fray.

Mike Ford described the situation as "being in a verdant field with gold bars lying all around. The question is how many can we throw in our pickup truck before a big vacuum cleaner comes down from the sky and sucks them all up." In essence then, being greedy and aggressive suckers ourselves, we wanted the cash to nail down the largest possible market share while we still could.

After numerous and lengthy discussions, Frank Chambers communicated the terms of the deal. What follows is a transcription of Dan Drake's notes taken while hearing the terms over the phone, with annotations explaining what the terms mean.

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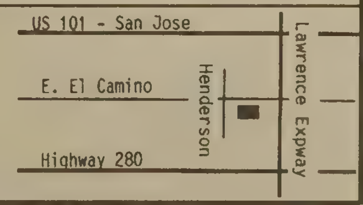

Terms I: Frank Chambers

- **$500-700K.** Size of investment in dollars. This would represent about 1/10 of the company.
- **$2 preferred, convertible to 1 share common.** The investment would be preferred stock, so that if the company failed the investor would get his money from the remains before any of the common shareholders. The stock could be converted to common stock at any time. This is conventional in venture capital deals.
- **If not liquid in 4 1/2 years, we offer to repurchase at 2x price (plus accrued dividends).** If the company did not go public or get acquired, thus providing an opportunity for the investor to "cash out," we would buy back the investment at twice its original value.
- **8% dividend from 2/1/85; with majority of preferred holders or the board able to substitute change in conversion ratio.** We would pay this dividend from the company's earnings. If we didn't have the earnings to pay the dividend, the foregone income would be used to increase the venture capitalist's ownership share of the company. Most venture capital deals work this way, but it's unusual to have the dividend start so soon after the deal.
- **On demand registration, unlimited piggyback.** The investor could, at will, demand that we make a public offering in order to enable him to cash out his stock. The company would bear all of the costs of the public offering. In this, or any other offering the company made, the investor would be able to sell his shares "piggyback," up to the total amount of the shares owned.
- **Options.**
  110,000 at $.75.
  Remainder at least $2+5% per six months.
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  Vesting at least four years.
  Forfeited options are canceled, not returned to pool.
- **Board of directors. Seven people: preferred elects one, one by agreement of preferred and common shareholders. Jack Stuppin to be on the board. Advisory committee to the board up to three people chosen by the investor.**
- **Representative of preferred investor approves: "All compensation matters," and all capital expenditures over $25,000.**
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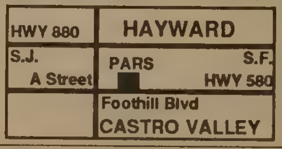

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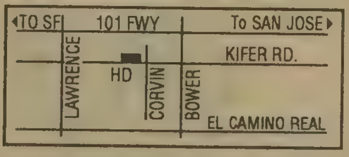

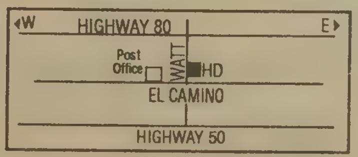

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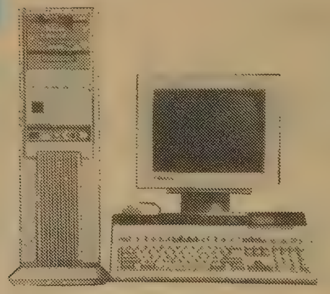

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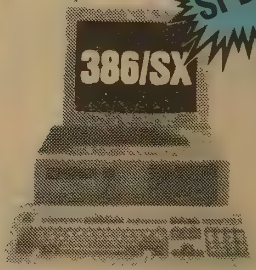

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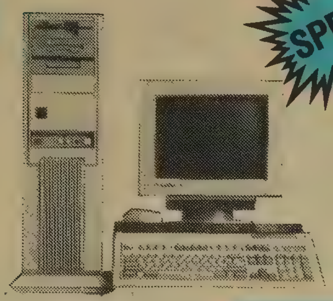

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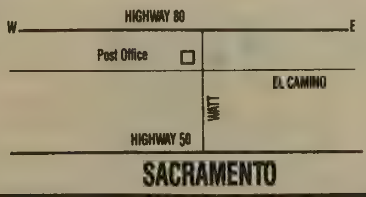

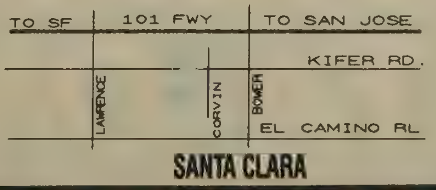

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Uncle Ralph's THE PLACE FOR COMPUTERS, PRINTERS
MAIL ORDER PRICES . . .

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HELP... We're overwhelmed!! We keep growing and we have immediate openings for experienced salespeople Excellent compensation, benefits, and training.
Ask for Timmy or Terry.
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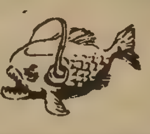
7 GREAT REASONS TO SHOP AT Uncle Ralph's



1. Everything's quality-tested by fanatics

We pre-screen everything we sell for compatibility & reliability because we hate problems even more than you do!

2. Low price guarantee

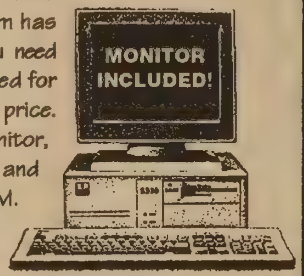
We'll match any local authorized dealer's price! We'll even protect you against lower advertised prices for 30 days after you buy. We deliver on our promise of low prices!

3. Money back if not delighted

10 day refund & 30 day exchange

If your new purchase isn't exactly what you need you can bring it back for a refund, or trade it in for a television, a stereo, or a fax machine! This is Uncle Ralph's, and we must have something you want!

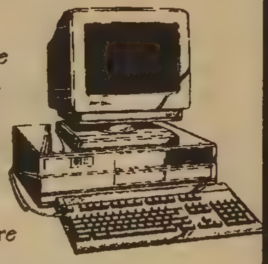
PANASONIC XT COMPLETE WITH MONITOR


MONITOR INCLUDED!

This complete computer system has everything you need to get started for a super low price. Includes monitor, DOS 3.3, and 640k RAM. Backed by a 1 year parts and labor warranty.

COMPLETE SYSTEM **$499** **$25/Month**

UNCLE RALPH'S SUPER -FAST 16 MHZ 286 WITH 2 MB RAM



Let us custom build one of these great computers for you. They're 33% faster than 12 mhz AT's and include 2MB RAM for software compatibility. System includes parallel and 2 serial ports, 1.2 MB floppy, our favorite keyboard, and a 1 year parts and labor warranty. (Monitor extra)

$799 **$40/Month**

ALR POWERFLEX 286
EASILY UPGRADES TO 386SX

Monitor Included!

The highly reviewed ALR powerflex computer can grow with you. Right now it's one of the best 286's on the market. Later, when you're needs expand just plug in a card and it becomes a 386 SX. System includes 40MB hard drive and monitor.

COMPLETE SYSTEM **$1,299** **$65/Month**

DTK 20 MHz 386 COMPUTER SYSTEM WITH MONITOR & 40MB HARD DRIVE

Lots of speed and a small price from one of the world's largest computer makers. The complete system includes a 20mhz 386 CPU, 40 mb hard drive, monitor, 1.2MB floppy, 1MB RAM, serial and parallel ports, 1:1 hard drive controller, monochrome monitor, and enhanced keyboard.

COMPLETE SYSTEM **$1,499** **$75/Month**

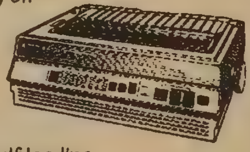
PRINTERS FOR EVERY JOB

BROTHER'S SUPER COMPACT PRINTER

You'll love this "fits anywhere" desktop printer. It blazes along at 100 cps and produces super sharp print. It's excellent for use with a laptop or anywhere that space is tight.

brother **$199**

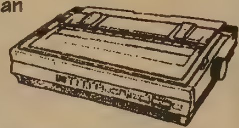
PANASONIC 24 PIN LETTER QUALITY PRINTER



Here's a great buy on the most popular 24 pin printer made. Excellent "letter quality" print, automatic tractor feed with paper parking and self loading. 2 year warranty!

Panasonic **$299**

PANASONIC WIDE CARRIAGE 24-PIN PRINTER
LETTER QUALITY



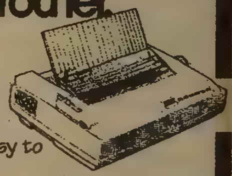
Here's a great buy on an outstanding wide carriage printer. It's easy to use, has excellent "letter quality" print, and an automatic self-loading tractor feed with paper parking. 2 year warranty!

$429 **$21/Month**

Panasonic

BROTHER'S TOP OF THE LINE, HI-SPEED LETTER QUALITY PRINTER

brother



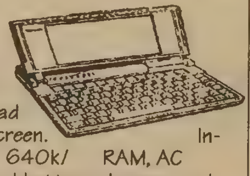
Our best dot matrix printer produces text and graphics that are good enough for desk top publishers. It's very fast (360cps) easy to use, and perfect for high output users.

$499 **$25/Month**

COLOR UPGRADE AVAILABLE $75

LAPTOP COMPUTERS

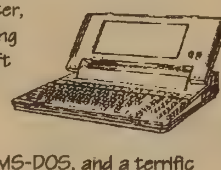
PANASONIC'S HOT NEW LAPTOP COMPUTER



This tiny laptop is barely bigger than a notebook, but it's fast, fun, and has a new easy to read backlit screen. Includes 640k/ RAM, AC adaptor and battery charger, and DOS.

Panasonic **$729** **$36/Month**

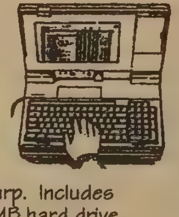
MITSUBISHI PORTABLE 286 COMPUTER WITH 20 MB HARD DRIVE, EGA SCREEN & MODEM



This complete package includes Mitsubishi's excellent 286 laptop computer, modem, carrying case, Microsoft Works, Super PC-Kwik disk accelerator/ print spooler, MS-DOS, and a terrific screen. AC only.

MITSUBISHI **$1,869** **$93/Month**

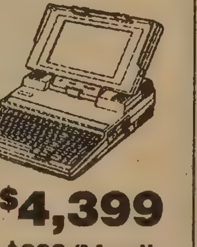
ALTIMA II THE MERCEDES BENZ OF LAPTOPS



Here's one of the most wonderful laptops ever! It has a removable keyboard with a standard enhanced key layout. The VGA screen is bright and razor sharp. Includes 2400B modem, 40MB hard drive, mouse and case come standard.

altima **$2,849** **$143/Month**

TOSHIBA 386 LAPTOP COMPUTER WITH 100MB HARD DRIVE



It's hard to believe a laptop can be this good. It's backlit VGA screen, 100MB hard drive and true 386 power make it an excellent choice for use on your desk and on the fly.

TOSHIBA **$4,399** **$220/Month**

SHARP'S REVOLUTIONARY NEW 4 LB NOTEBOOK COMPUTER

This is the tiny 286 computer that everyone has been waiting for. Includes 20 MB hard drive, and a revolutionary new triple super-twist backlit screen. Scheduled delivery date is July 25, and you'll want to see it before you buy any other notebook.

INTRODUCTORY SPECIAL

FAX MACHINES

MURATA FAX WITH DOCUMENT FEEDER

Transmit and receive documents from around the world. Built in telephone, copier and 5 page document feeder.

MURATA

$399 **$20/Month**

A SPEEDY SHARP FAX MACHINE THAT DOES HALFTONES

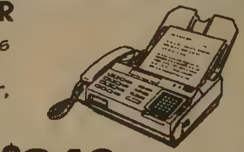
Send & receive in a mere a 15 seconds per page. Plus it has a 5 page document feeder, 16 level halftones, & automatic fax/ phone changeover.

SHARP

$529 **$26/Month**

SHARP FAX WITH CUTTER

This machine has all the features you want but at a price you will love. Features, document feeder, paper cutter, half tones, 13 second transmition speed, and an error correction system.



$849 **$42/Month**

FAXES & PERIPHERALS *Uncle Ralph's*

LOCAL SERVICE AND CONVENIENCE

4. One hour repair service
If you have a problem with one of our computers we can usually have it fixed within 1 hour. It's important to us that our customers remain satisfied.

5. 90-day interest-free financing
You can defer payment for 90 days and pay no interest at all! Or you can charge it to your Uncle Ralph's credit card account.. Sometimes we even take cash! Subject to lender approval.

6. Open 7 days a week
We're open for you 7 days a week— til 8 pm Monday through Friday, and til 6 pm on weekends.

7. We'll keep you satisfied!
We've been putting smiles on faces for 8 years. We know what it takes to do a good job...and we do it everyday!

SAVE ON DISKETTES!

TDK

(BOXES OF 10, LIFETIME GUARANTEE!)

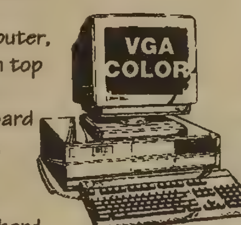
TDK 3.5" 720K.............$7.99
TDK 3.5" 1.44..............$19.95
TDK 5.25" 1.2MB...........$9.95

UNCLE RALPH'S/MYLEX 386SX WITH 45MB HARD DRIVE, 2MB RAM & VGA COLOR MONITOR

You'll love this computer! It's has a Mylex motherboard so it's dependable, and very fast, plus it comes with the best keyboard you've ever touched, and a superbly crafted "accu-fit" case. Complete system includes parallel and serial ports, 2 MB RAM, 1.2MB floppy drive, fast 45 MB hard drive, VGA color monitor, and Uncle Ralph's helpful support and service.

COMPLETE SYSTEM **$1,799** **$90/Month**

UNCLE RALPH'S/MYLEX 386/20, STATIC RAM CACHE, 45MB HARD DRIVE, 4 MB RAM, 3.5" AND 5.25" FLOPPY DRIVES &VGA COLOR MONITOR

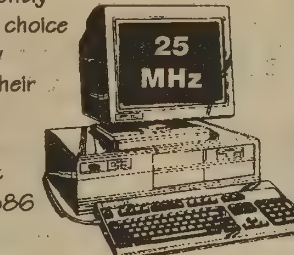


Here's a lot of computer, built exclusively with top brand components. The Mylex motherboard is the best there is, and we use Teac floppy drives and a super fast Fujitsu hard drive. The complete system includes our top of the line keyboard and case, game, parallel, and two serial ports. 1 year Warranty.

COMPLETE SYSTEM **$2,495** **$125/Month**

ALR POWERFLEX 25 MHZ 386

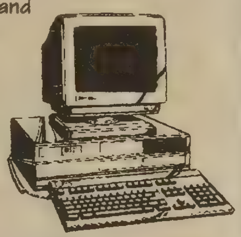
Upgradeable to 486



ALR consistently gets editors choice and best buy awards for their outstanding performance and excellent value. This 386 makes an excellent file server because it's fast and reliable, and unlike most computers, it is designed to grow with the needs of your network.

EXCELLENT FILE SERVER

UNCLE RALPH'S/OMNITEL 33 MHZ 386 WITH STATIC RAM CACHE, 100 MB HARD DRIVE, 4MB RAM, 2 FLOPPY DRIVES, AND 1024X768 MULTI-SCAN MONITOR



The OmniTel motherboard has been making some big waves lately and we've packaged it with other top brand components to create an outstanding high performace system. Complete system includes Conner hard drive, Viewperfect monitor, ATI video card, parallel, game, and 2 serial ports, and your choice of excellent keyboards.

COMPLETE SYSTEM **$3,475** **$174/Month**

PRINTERS FOR EVERY JOB

PANASONIC 8 PAGE/MINUTE LASER PRINTER

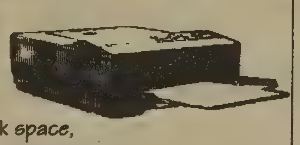
Panasonic

True laser output, 11 resident fonts, HP laserjet II emulation, 250 page paper tray. 512k RAM. Designed for high output applications, and perfect for busy offices.

$799 **(After $50 rebate)**

HP'S BEST SELLING LASER PRINTER

HEWLETT PACKARD

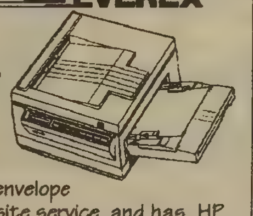


Hewlett/Packard's desktop laser printer is here and it's terrific. It prints four pages a minute of razor sharp text and graphics, takes up almost no desk space, and it's quiet as a mouse.

$979 **$49/Month**

THE BEST LASER PRINTER VALUE WE'VE EVER SEEN!

EVEREX

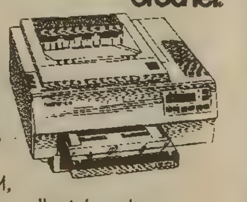


This Everex is a great choice for anyone who needs a lot of fonts and razor sharp graphics. It's inexpensive to run, comes with a built in envelope feeder, 132 fonts, on site service, and has HP laserjet II, IBM, and Diablo emulations.

$1,099 **$55/Month**

BROTHER'S TOP-RATED POSTSCRIPT LASER PRINTER

brother



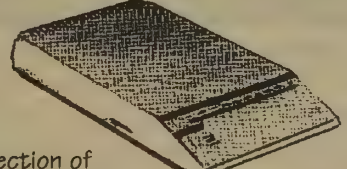
Here's the terrific laser printer that's been getting all the top reviews. It's particularly fast and is great for all serious desktop publishers. Comes with 3 MB RAM, 35 built-in fonts, and excellent imaging.

LIMITED QUANTITIES

$2,299 **$115/Month**

MODEMS

MODEMS BY EVEREX, ANCHOR & CARDINAL



We stock a large selection of quality modems. Manufactured by some of the most respected manufacturers in the PC world, they will ensure the integrity of your data during transmission and reception.

***from* $59.95**

Insure Your Data's Integrity !

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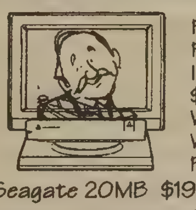
MOTHERBOARDS BY MYLEX, ORCHID DEICO & OMNITEL

286 16Mhz	call for best price
386SX	call for best price
386 20MHz w/cache	call for best price
386 25MHz w/cache	call for best price
386 33MHz w/cache	call for best price
486	call for best price

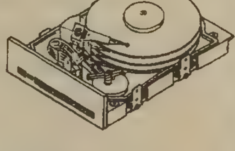
BUILD YOUR OWN COMPUTER!

GREAT PRICES ON
☞ Mylex motherboards ☞ RAM chips
☞ Power supplies, video cards & everything you need to build it yourself!

MONITORS & HARD DRIVES



Packard Bell 12" mono	$79.95
Packard Bell 14" paper-white	$129.95
Imtec VGA	$329
View Perfect hi-res VGA	$429
View Perfect 1024X768 Multi-VGA	$529
Panasonic 1024x768VGA	$499



Seagate 20MB $199
Miniscribe 20 MB $219
Seagate 40MB ST251-1 $310
Microscience 40 MB, 28 MS $369
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Conner 100 MB $649
Toshiba 80/110MB RLL $699
Micropolis 338MB ESDI w/controller $1,695
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8 Years of Best Prices!

- **Board of directors: Seven people: preferred elects one, common elects six.**
- **Ceiling on executive salaries and bonuses until some numbers (sales and profit) achieved; override by preferred representative. Preferred representative approves capital expenditures over $100,000.**
- **John Walker: key man insurance; contract, no non-competition.** Being an ornery S.O.B., I said that signing a non-competition agreement with a company in which I was the largest shareholder was beneath my dignity and that I wouldn't do it. Moral: don't pick an asshole to be president of your company.
- **Frank Chambers approves investors, but present stockholders can buy in subject to $ ceiling and regulatory problems.** We didn't want the venture capitalist to be able to veto further investments by people who got in before he did.
- **In general, the constraints have drop-dead provisions.** This meant that every constraint on our freedom to run the company would expire when we reached some well-defined performance milestones.

He didn't like it. So, we got together and attempted to come up with another offer which would be acceptable. Here it is.

Terms III: 5/10/84

- **$500-700K.**
- **$2 preferred, convertible.**
- **Repurchase terms OK (?)** We acceded to the original terms.
- **Forced conversion if we get to $10 million (?) annual sales and $1 million annual profit or make a public stock offering over $5 million.**
- **One demand registration, piggyback, *after* 1/1/87 for >$5 million.**
- **Options: 100,000 shares at $.75, 200,000 shares at $1.60, 200,000 shares at $2.00, 200,000 shares at $3.00, 200,000 shares at $4.00. Majority of each class of stock to improve any new plan. Vesting at best 50-25-25 after the first 100,000 shares.** This meant that after the first 100,000 shares of options (which were committed to fulfilling options we'd already granted to people), those who received options would receive 50% of their shares the first year, 25% the second year, and 25% the third year. Forfeited options return to pool.

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All our systems include 40MB Hard Drive and Monitor!

All Systems Include:
- 1MB Hi-speed RAM installed
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- Support MSDOS, OS/2, XENIX, NOVELL
- Upgrade any system to 80MB Hard Drive add $200

ALL SYSTEMS CARRY FULL 1 YEAR WARRANTY ON ALL PARTS AND LABOR

386SX-16 MHz
- High resolution VGA card
- Black & White VGA monitor
- 40MB Hard Drive

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- Black & White VGA monitor
- 40MB Hard Drive

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- Black & White VGA monitor
- 40MB Hard Drive

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This Month's Specials
- 80MB 3.5" SCSI Hard Drive w/SCSI 16 bit Controller $549

While Supplies Last

Video Cards

VGA 16	$99
VGA 16-512	$265

Monitors

VGA Mono	$175
VGA	375
Multi Scan	449
NEC-3D	625

Printers

Panasonic 1180	$185
Panasonic 1191	245
Panasonic1124	325
Panasonic 1624	425
Panasonic Laser	1395
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25MHz-64K Cache: • 4 MB RAM • 140 MB Hard Drive • Novell ready..... $3795
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1-900-844-2273/CREDIT
1-900-844-9600/DATING
1-900-844-4477/STARS
1-900-844-6397/NEWS
1-900-844-3456/MOVIES
1-900-844-8810/DATING
1-900-844-8448/SPORTS
1-900-844-4488/PERSONALS
1-900-505-1505/CONFERENCE
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- Made in USA, 1 year warranty

SPECIAL PIXEL VGA
with 1MB
Video Ram
$245

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RX7100 $PECIAL

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Goldstar 16″ VGA with OEM Paradise (512K)	795

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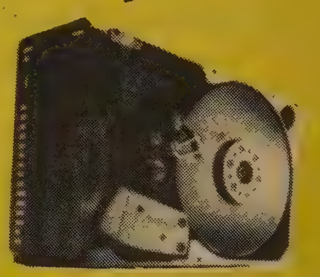

M2261E 5.25″, 415MB ESDI	$1490
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M2263E 5.25″, 778MB ESDI	$1990
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AMI GEMINI 486-25
AMI MKIII 386-25
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AMI 386SX

CONNER

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CDC-766
CP3184 81MB, 25ms
CP3104 104MB, 25ms
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OMNITEL

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MICRONICS

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386-35 32K/64 CACHE
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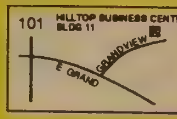

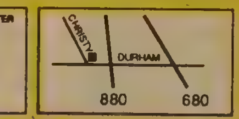

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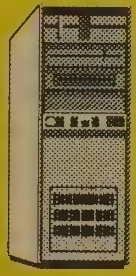

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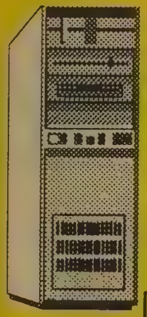

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AMI MkIII 386-25

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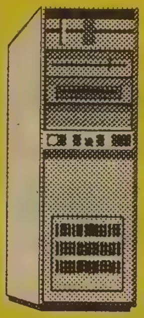

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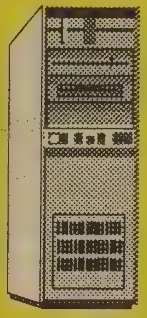
MONO	1790	2150	2350	2450
VGA	2090	2450	2650	2750
SVGA	2190	2550	2750	2850

MICRONICS 386-33 ASIC or OMNITEL 386-33C



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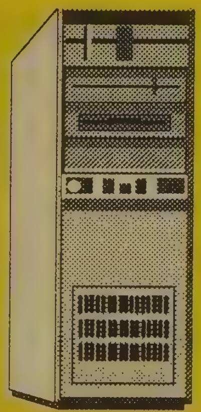
VGA	2290	2650	2850	2950
SVGA	2390	2650	2950	3050



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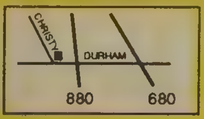

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"In not accepting our terms, which differed from his original proposal primarily in issues of philosophy, not money, [the venture capitalist] chose to forego an investment of $500,000 which, if held until the stock price hit its 1987 high, would have appreciated to more than $37 million."

- **Board: ask Chambers†, Ellison, Stuppin. (? Unsettled.) What are the terms on paper? †If not on board, an advisor.**
- **$75,000 ceiling on officer and director salaries. Override by six or seven directors.**
- **$25,000 on capital expenditures. Override how?**
- **John Walker: key man insurance; employment contract to "devote substantially all his time."**
- **Frank Chambers approves investors. Common holders can buy in (n.b. might have to keep it intrastate to avoid sophisticated investor problems).** Since people who joined the company in the beginning and worked themselves to exhaustion to build it to the point that venture capitalists were interested in investing were not *ipso facto* "qualified" to risk their savings by investing in their own company since they were not already wealthy. This is an example of what was referred to in the 1980s as the "opportunity society."
- **First refusal on private equity offerings.**

After these terms were presented, it was clear that we would never come to an agreement on the issue of awarding stock options to employees to give them a real stake in the company's success. In addition, the overall flavour of the deal seemed to us totally inappropriate for a company which was, at the time of these negotiations, generating sales equal to the size of the deal every month and generating after-tax profits close to the size of the deal every quarter.

We couldn't believe that this was the best deal obtainable for venture funding of the company, and we were inclined to ask around to see if this was reasonable. But, our Distinguished Financial Advisor informed us that this would constitute "shopping a deal" when "a deal was on the table" which was right out by the genteel standards of the venture community, and that he could not countenance such unrefined behaviour (notwithstanding the fact that in the real world this kind of collusion is called "conspiracy in restraint of trade" and people go to jail for it).

So, after a brief weekend meeting in which we discovered we all agreed on an obvious conclusion, we decided to graciously decline this generous offer of funding and carry on with our own resources. Upon hearing this decision, Jack Stuppin said that if we didn't take this deal, he did not wish to be a shareholder and wanted us to buy him out. Not wishing to deplete our treasury, we declined. In not accepting our terms, which differed from his original proposal primarily in issues of philosophy, not money, Frank Chambers chose to forego an investment of $500,000 which, if held until the stock price hit its 1987 high, would have appreciated to more than $37 million.■

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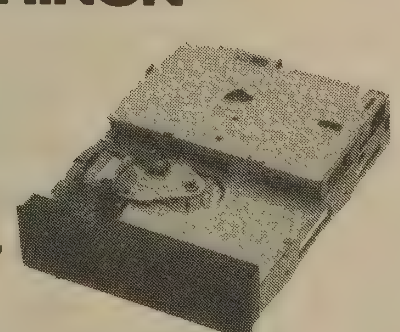

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PRODUCT SPOTLIGHT

New Products

MACINTOSH

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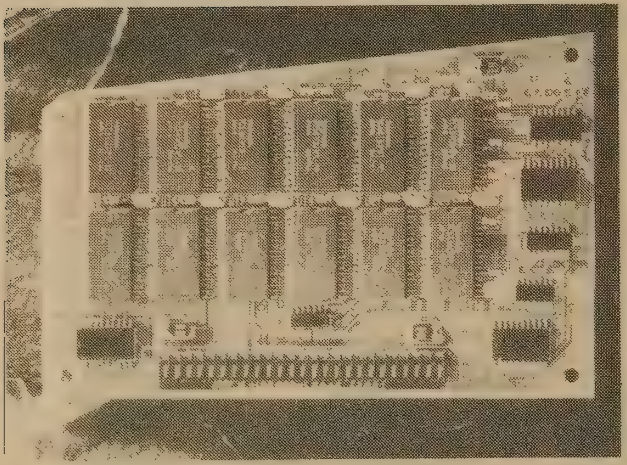
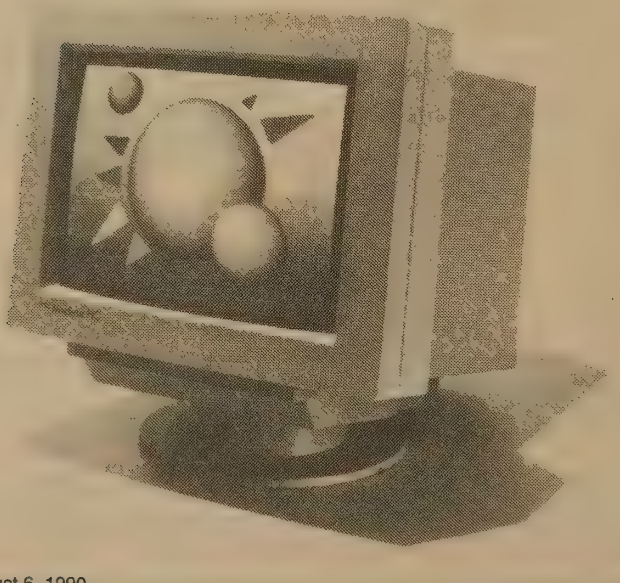
Columbus Lifetime Memory, Inc., has introduced a 3Mb RAM board for the Macintosh portable. The board increases memory with no noticeable decrease in the life of the battery. Designed and manufactured to meet Apple's specifications, Columbus offers a lifetime guarantee against electronic failure to the original user. ($1495) Columbus Lifetime Memory, Inc., 305 Seventh St., Huntington Beach, CA 92648. 1-800-233-6233.



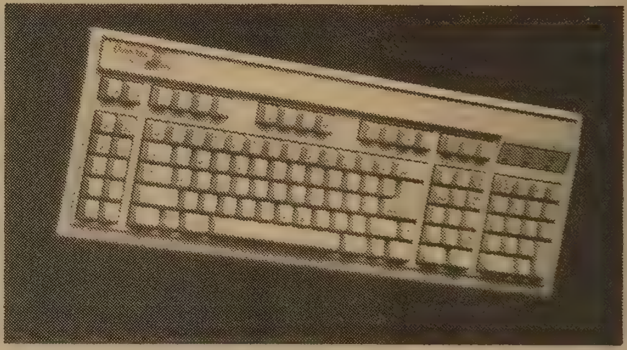
NEC MACSYNC COLOR MONITOR

NEC Technologies has designed a high-contrast color monitor to support the needs of Macintosh users. The 14" MacSync monitor has 640 x 480 resolution and enhances True Color 24-bit graphics images by displaying over 300,000 colors. Standard features include dark tinted CRT, an ergonomically designed cabinet, analog input, dedicated signal cable and a tilt/swivel base. ($699) NEC Technologies, Inc., 1255 Michael Dr., Wood Dale, IL 60191. (708)860-9500.



THE ULTRA KEYBOARD FOR MACINTOSH

The OmniMac/ULTRA, by Northgate Computer Systems, provides an alternative to Apple and Macintosh keyboards. Users experience increased typing speed and accuracy from the full stroke ALPS click/tactile mechanical key switches. The enhanced 119-key layout features Apple-style legends and two sets of functions keys. For added convenience, OmniMac ULTRA has a separate numeric keypad to speed calculations and keep cursor control keys free. Northgate offers a sixty-day no-risk trial period and a five year warranty on all OmniKey and OmniMac keyboards made with click/



PRODUCT UPDATES

- ➤ **Apple Computer** has released **Hypercard 2.0**. The upgrade has more than one hundred new features, including variable card size, multiple windows and improved text styles. Contact: Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408)996-1010.

- ➤ **Lotus** announced an enhanced edition of its **1-2-3 Release 2.2** spreadsheet for the government market. The new version includes the requested file translation capability between Multiplan 4.0, Enable 2.0, SuperCalc 4.0 and Lotus 1-2-3. Contact: Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142. (617)577-8506.

- ➤ **Solutions, Inc.** has begun shipment of **Faxgate Plus v1.1**, which includes support for users of QuickMail from CE Software. Solutions also offers an introductory five-user pack of MailMaker workstation software with each purchase of Faxgate Plus. Contact: Solutions Inc., 30 Commerce St., PO Box 783, Williston, VT 05495. (802)865-9220.

- ➤ **Sysgen, Inc.** announced Release 1.4 of its **MaxiBack** software for Novell ELS and Advanced NetWare operating systems. The new release adds the capability to backup files located on a hard disk anywhere on the network. Contact: Sysgen, Inc., 556 Gibraltar, Milpitas, CA 95035.

- ➤ **WordPerfect Corp.** has released **PlanPerfect 5.1**, an upgrade which provides compatibility between PlanPerfect and WordPerfect 5.1. The update for PlanPerfect 5.0 users costs $39, for MathPlan users the update is $75. Contact: WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057. (801)222-5008.

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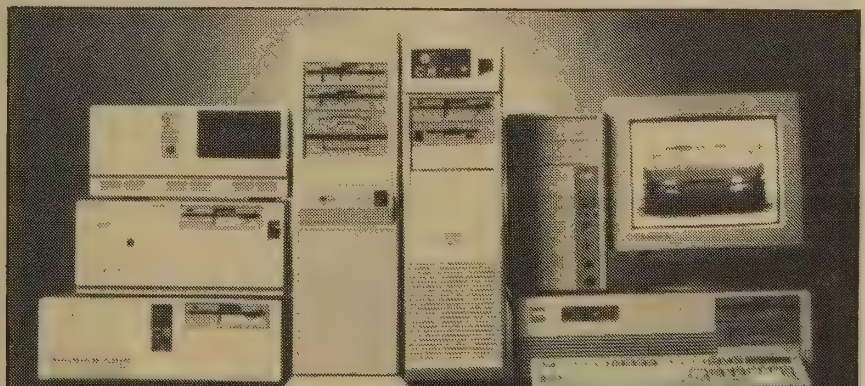

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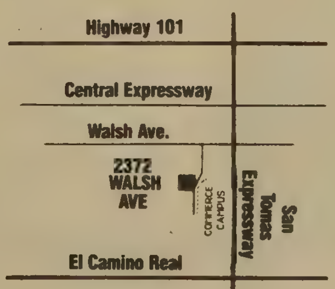

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tactile key switches. ($159) Northgate Computer Systems, Inc., PO Box 41000, Plymouth, MN 55441. 1-800-548-1993.

LAPIS LINKS MAC SE AND TV

The DisplayServer SE from Lapis Technologies, Inc. now comes with a near-NTSC TV output. This will make it possible to display flicker-free Mac SE output on a regular TV screen, over closed circuit TV, or to record the signal on a VCR. The television is a separate output board that installs in the Mac SE with the DisplayServer SE video board. A standard RCA jack on the output board provides composite black-and-white video for display on NYSC media. ($79.95) Lapis Technologies, Inc., 1210 Marina Village Pkwy., Alameda, CA 94501.

PRODUCT UPDATES

Microsoft Windows 3.0

- The enhanced Windows 3.0 version of **PageMaker** for the PC has been announced by **Aldus Corp.** Registered owners of PageMaker 3.0 for the PC can purchase the update for $25. For subscribers to Aldus's CustomerFirst and Extended Technical Support Service programs, as well as customers who purchased PageMaker after May 22, the update is free. Contact: Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (206)628-6594.

- A new "**Notify**" feature for **cc:Mail LAN** packages marks cc:Mail support for Windows 3.0. This will enable users to receive instant notification of new cc:Mail messages within their Windows desktop. This is available as a free upgrade to all registered cc:Mail users. Contact: cc:Mail, Inc., 2141 Landings Dr., Bldg. T, Mountain View, CA 94043. (415)961-8800.

- **Informix Software** has upgraded **Wingz** for use with Windows 3.0 and OS/2 Presentation Manager. Version 1.1 for Windows 3.0 and PS/2 PM is file compatible with v1.1 of Wingz for the Macintosh and for NextStep. Contact: Informix Software, Inc., 4100 Bohannon Dr., Menlo Park, CA 94025. (415)926-6300.

- The **Above Board** memory boards, **Math CoProcessors**, **Connection CoProcessor** fax boards and the **Inboard 386** accelerator board from **Intel's PCEO** support Windows 3.0. Contact: Intel Corp., Personal Computer Enhancement Operation, CO3-7, 520 NE Elam Young Pkwy., Hillsboro, OR 97124. 1-800-538-3373.

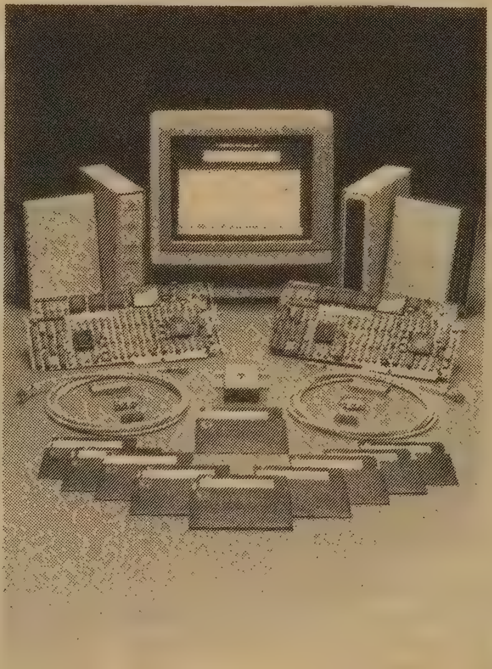
- **Tandon Corp.** will offer Windows 3.0 with its complete line of desktop and laptop personal computers. Contact: Tandon Corp., 301 Science Dr., Moorpark, CA 93021. (805)523-0340.

- **Zenith Data Systems** is now factory-installing **Windows 3.0** on all hard disk drives of its 286- and 386-based computers. Contact: Zenith Data Systems Corp., 1501 Feehanville Dr., Mount Prospect, IL 60056. 1-800-553-0331.

LOCAL AREA NETWORKS

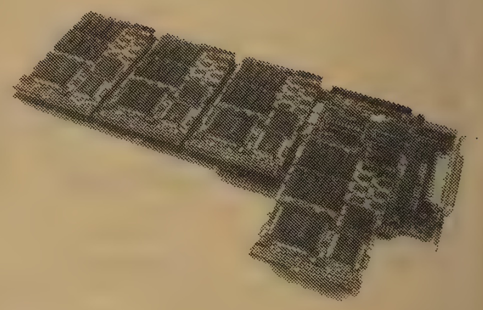
ARCNETPLUS—THE NEXT GENERATIONS

In 1977 Datapoint Corp. introduced ARCNET, the Attached Resource Computer network, bringing a new concept of computing to the marketplace: distributed data processing (DDP). DDP, in turn, became the architecture model from which the client/server application architecture of the 1990s has evolved. ARCNETplus represents the second generation in local area networks—and the first multi-bit rate LAN. Building on Datapoint's experience, ARCNETplus offers operation rates eight times faster than earlier ARCNET versions, streamlined packet overhead, variability in packet sizes to optimize both transaction processing applications and rapid bulk-data transfers, and support for as many as 2,047 nodes per network segment. Datapoint Corp., 9725 Datapoint Dr., San Antonio, TX 78229. 1-800-733-1500.



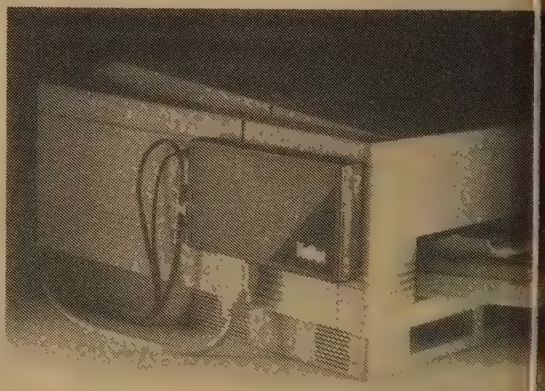
EGNA MAKES THE UNTERMINAL MORE GRAPHIC

The Enhanced Graphics Network Adapter (EGNA), by Advance Micro Research, Inc., is a multiuser color graphics display adapter that introduces fast color text and bit map graphics to 386- and 486-based multiuser PC systems. The multiuser graphics display adapter replaces Intelligent I/O and slow ASCII text-based dumb terminals. Under operating systems such as XENIX, UNIX and Multiuser-DOS, EGNA connects multiple standard EGA monitors and PC/AT keyboards as UnTerminal remote user stations. In a multiuser environment, each EGNA UnTerminal user experiences a true standalone PC feel and all of the unlimited display capabilities of the system's main console. ($849) Advance Micro Research, Inc., 2045 Corporate Ct., San Jose, CA 95130. (415)456-9400.



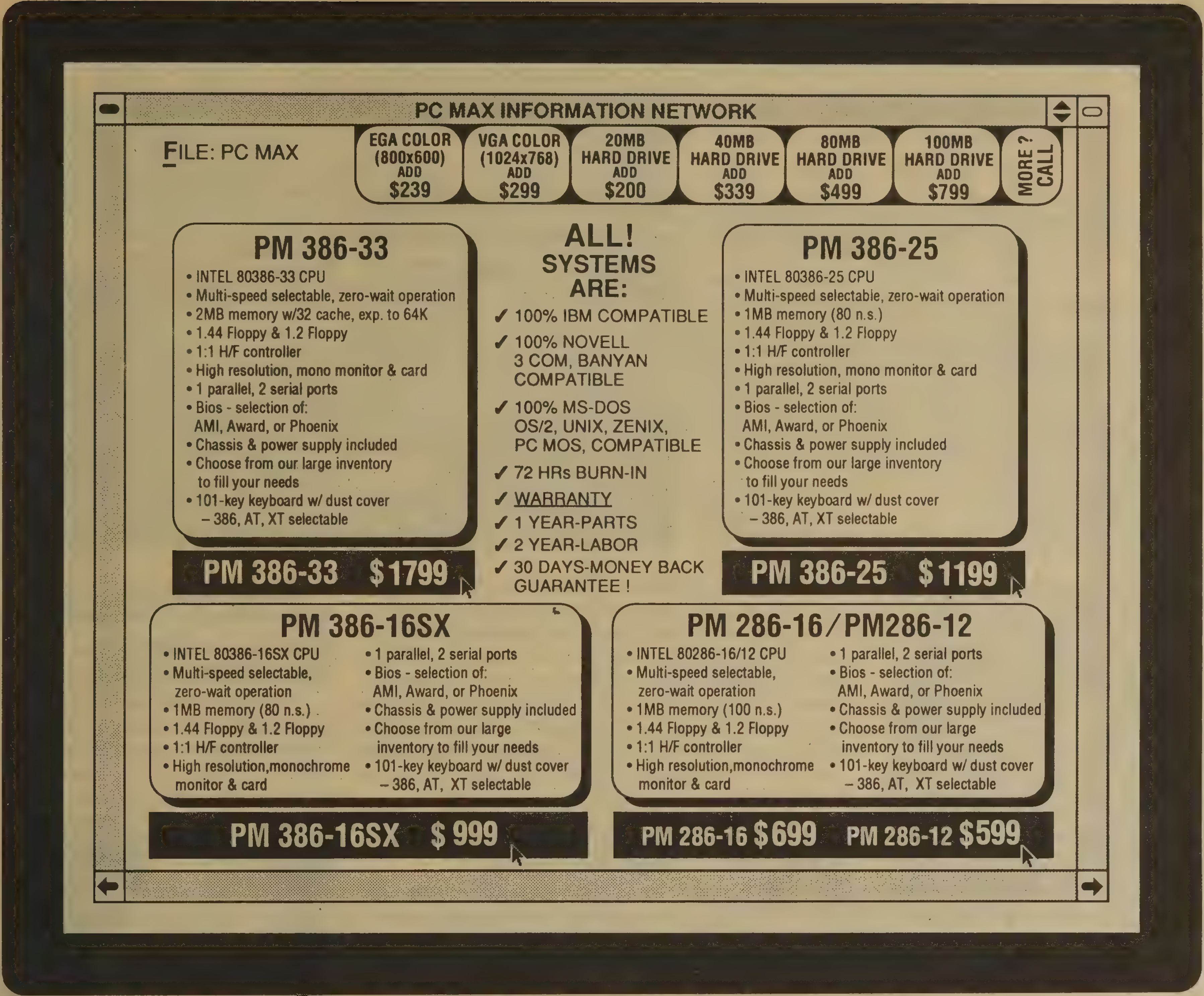
PLUG-AND-PRINT SERVER FROM INTEL'S PCEO

NetPort, from Intel's Personal Computer Enhancement Operation (PCEO), is a compact printer server for Novell networks. Unlike the traditional method of connecting printers to file servers, the NetPort print server lets users locate printers anywhere along the network. And unlike dedicated PC print servers, it eliminates the need for a dedicated PC host, reducing network security risks and simplifying installation, while increasing user productivity. ($695) Intel Corp., Personal Computer Enhancement Operation, CO3-7, 5200 NE Elam Young Pkwy., Hillsboro, OR 97124. 1-800-538-3373.



FUJITSU'S STOREDGE OFFERS A GIGA-EDGE

To meet the growing demand for maximum reliability and high capacity data storage solutions on today's LANs, Fujitsu America, Inc. introduced a data storage subsystem with more than 2Gb of online storage capacity. Fujitsu's StorEdge is designed for com-



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- 101-key keyboard w/ dust cover – 386, AT, XT selectable

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PM 286-16/PM286-12

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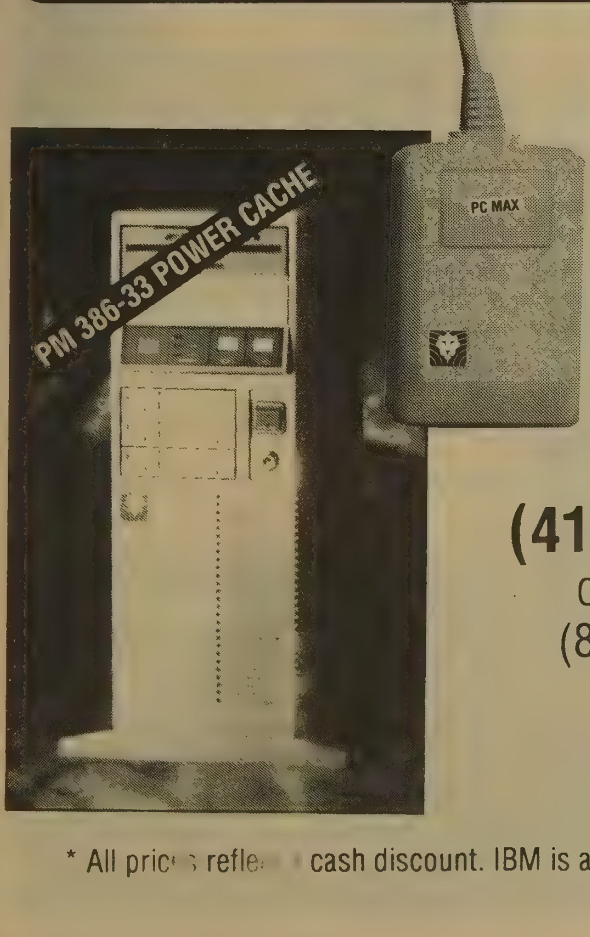

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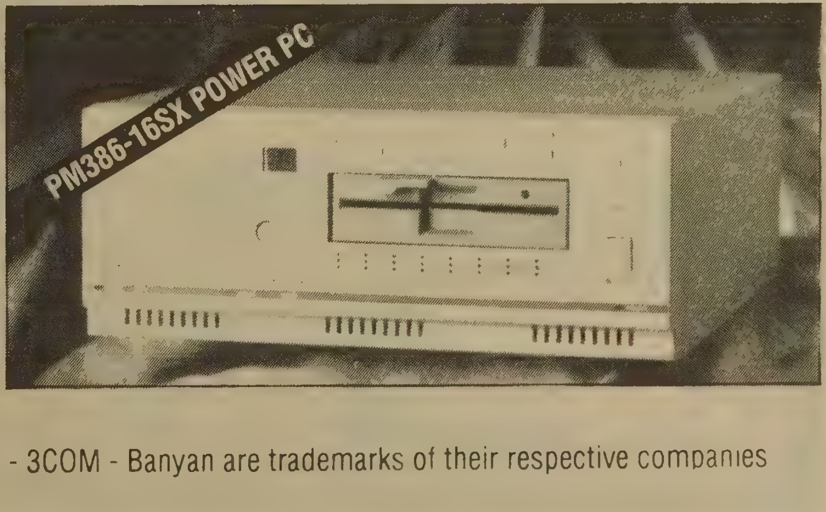

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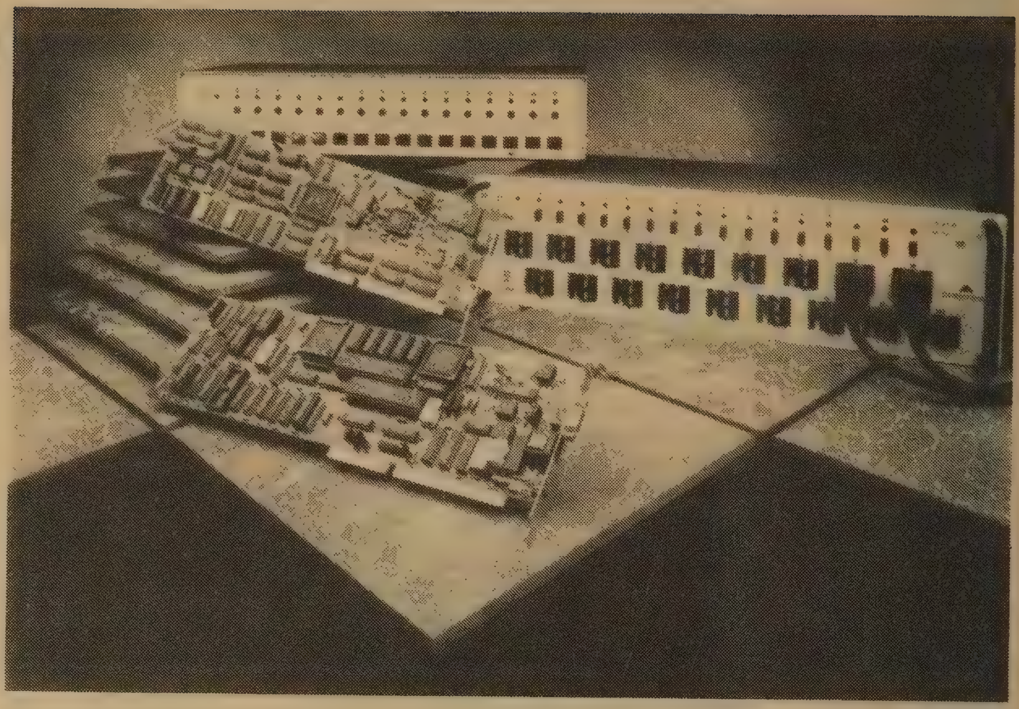
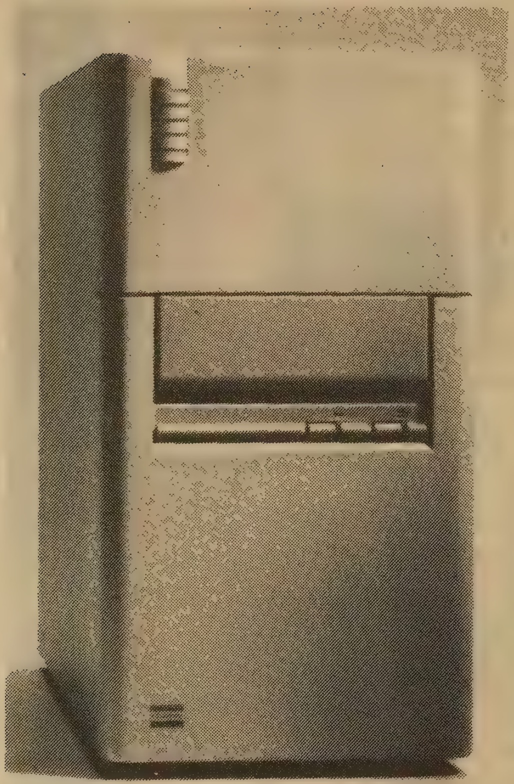


patibility with Novell NetWare 386, and is certified for NetWare 286 and NetWare SFT. StorEdge offers flexibility by providing both online storage and tape backup. The subsystem can be configured with any combination of up to three Fujitsu 778Mb or 380Mb 5.25" disk drives, and 0.5" cartridge tape drives. The new Fujitsu 778Mb 5.25" drives carry the industry's highest reliability rating of an expected 200,000-hour mean-time between failure. In addition, StorEdge is the only storage subsystem that comes with a free, one-year on-site service warranty. (Suggested retail price starts at $4300) Fujitsu America, Inc., 3055 Orchard Dr., San Jose, CA 95134. (408)432-1300.



NOVELL'S WORKPLACE FOR THE MACINTOSH

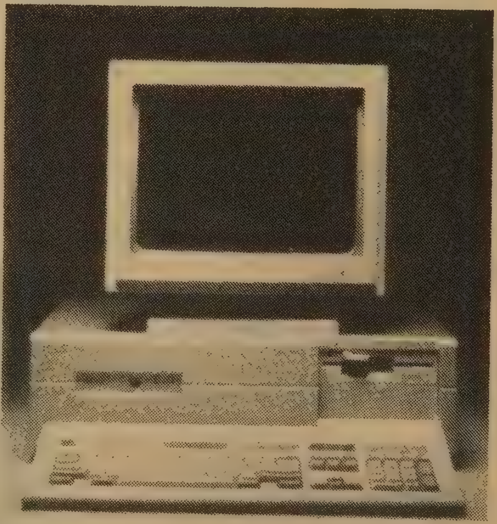
Novell, Inc., has introduced a new version of its LAN WorkPlace for Macintosh networking software, giving Macintosh computers full access to host computers, peripherals and services on business-wide TCP/IP networks and reinforcing Novell's commitment to heterogeneous connectivity. LAN WorkPlace for Macintosh supports Macintosh user interface standards to access a full range of TCP/IP network services, exchanging information with systems such as VAX minicomputers and UNIX-based workstations, while supporting multiple sessions with other computers and NetWare servers. ($250) Novell, Inc., 122 East 1700 South, Provo, UT 84606. 1-800-453-1267.

ADDITIONAL ADAPTATIONS FROM THOMAS-CONRAD

Thomas-Conrad Corp. has announced the delivery of several network drivers for its adapters operating with a variety of networking operating systems including Novell's NetWare 386, Artisoft's LANtastic, Performance Technology's POWERLan, and the various implementations of LAN Manager. The first driver released is an accelerated NetWare 386 driver for Token-Ring networks that works in both servers and workstations, and bypasses the standard Adapter Handler Interface (AHI), resulting in reduced overhead and improved network performance. NetWare 286 and 386 Token-Ring source-routing drivers will also be available with each Thomas-Conrad Token-Ring adapter. Thomas-Conrad Corp., 1908-R Kramer Lane, Austin, TX 78758. (512)836-1935.

SAMSUNG ANNOUNCES THE 386A3 FILE SERVER

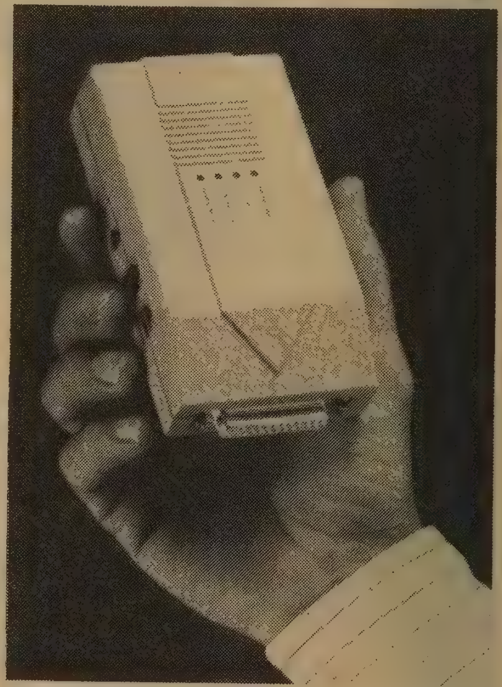
The Samsung 386A3 is a 33MHz 80386-based file server designed for large networks, high-volume LAN applications, large databases and advanced applications, such as CAD and CAD image libraries. It is fully compatible with Samsung's SE2100 and SE2200 LAN Ethernet interface cards, as well as Novell-certified compatible with all versions of NetWare. The 386A3 includes 4Mb RAM, expandable to 16Mb with the use of a memory upgrade board. It also features eight expansion slots, one 32-bit and seven 16-bit. ($6499) Samsung Information System America, Inc., 3655 North First St., San Jose, CA 95134. 1-800-446-0262.



COMMUNICATIONS

BACKPACK FAX/MODEM— DON'T TRAVEL WITHOUT ONE

The Smart One Traveler, Best Data's new 2400 bps portable pocket modem, enables users to send faxes. Small enough to fit into a pocket, brief case or backpack, this modem easily attaches to any laptop or desktop—AT/XT compatible or Macintosh computers. When in Fax mode, the Traveler transmits ACSII-text, PCX-PC Paintbrush, TIFF-scanner and IMG-GEM Ventura Publisher files by converting them to a bit-mapped format. It also incorporates fax-mail-merge features, time scheduled transmissions and automatic redial. The purchase price of the Traveler includes Fax/modem software, a 9V battery, an external AC power supply, LED lights and a speaker. ($299) Best Data Products, Inc., 8304 Deering Ave., Chatsworth, CA 91311. (818)773-9600.



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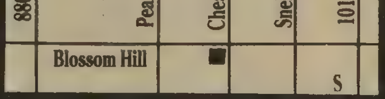
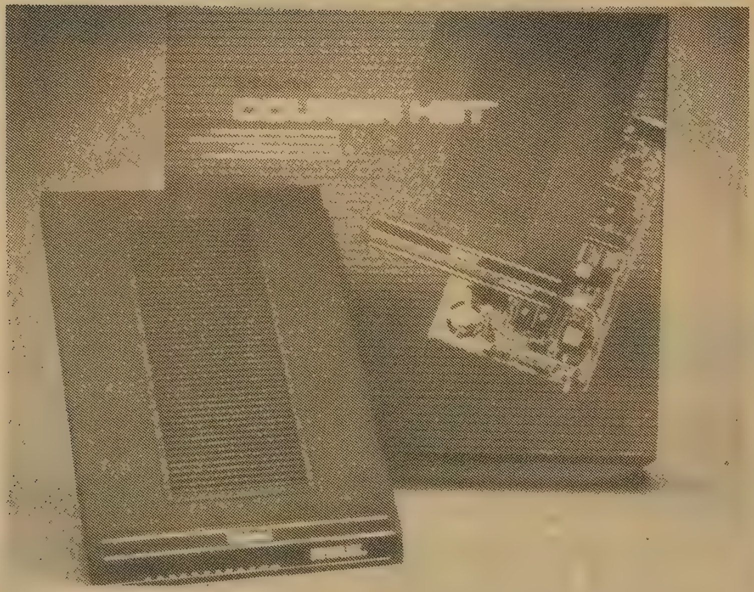


SHARP MAKES 9600 BPS MODEMS AT 2400 BPS PRICES

Utilizing its Extended Baud Rate (EBR) technology, Sharp now offers two revolutionary PC modems that deliver 9600 bps full-duplex performance for the price of a 2400 bps unit. Sharp's 9624 modem line includes the 9624 internal PC modem and the 9624e external modem. Both feature MNP5 Error Correction, and through EBR can run in a full-duplex, asynchronous data mode at 9600, 2400, 1200 and 300 bps. The modems are compatible with other dial-type modems, including V22A, Bell 212 and Bell 103. (The 9426 lists for $299, the 9624e for $399) Sharp Digital Information Products, Inc., 16841 Armstrong Ave., Irvine, CA 92714-4979. (714)261-6224.

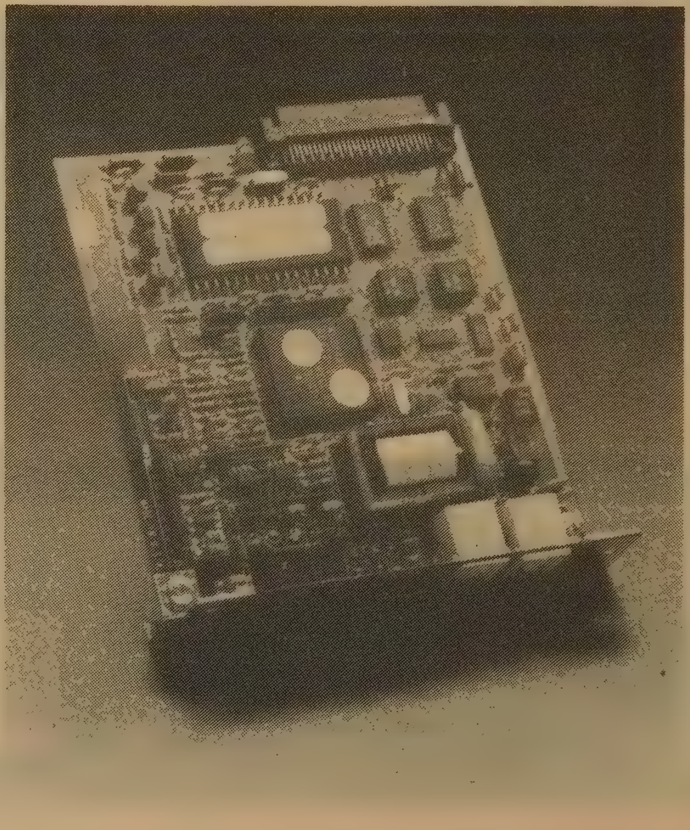


HIGH SPEED MODEMS IN TRIPLICATE FROM US ROBOTICS

US Robotics has introduced three new modems. The Courier HST Dual Standard, USR's top model, combines the company's proprietary 14,400 bps HST technology with CCITT's V.32 9600 bps transmission standard. Their successful data compression uses of a higher-level algorithm than MNP5 compression, producing about 35 percent better results. The Courier HST and the Courier V.32 transmit at 14,000 and 9600 bps, respectively. US Robotics is offering free upgrades for modems purchased after October 1, 1989. There will be a $50 charge for upgrading modems purchased prior to that. (The Courier HST Dual Standard lists for $1,595, the Courier HST for $995 and the Courier V.32 for $1,099) US Robotics, Inc., 8100 North McCormick Blvd., Skokie, IL 60076. 1-800-DIALUSR.

MEGAHERTZ MAKES FAX/ MODEM FOR TOSHIBA LAPTOPS

Megahertz's Easy Talk Fax allows users to send, receive, view and edit fax transmissions on a Toshiba laptop. This 9600 bps FAX/modem also doubles as a Hayes-compatible 2400 bps modem. The card comes with Easy Talk Fax software, which provides mouse support, on-line help menus, automatic generation of cover sheets and other assistance. Easy Talk Fax is covered by a five-year warranty that includes toll-free technical support. A modular phone cord and Procomm communications software are also included. ($599) Megahertz Corp., 4505 South Wasatch Blvd., Salt Lake City, UT 84124. (801)272-6000.



THE QUEST FOR THE COMPLETE COMMUNICATION SYSTEM

FaxMail, FaxQuest's merging of facsimile and PC technology, is a breakthrough in document delivery systems. It combines an IBM compatible computer with specialized software that can accommodate four outgoing fax lines and four incoming voice lines. This enables the caller to request and receive documents 24 hours a day from anywhere in the country. The FaxMail database can be accessed through a voice menu, and then the caller can select the document he or she needs and wants to retrieve. FaxMail is fully automated and can operate unattended. ($7500) FaxQuest Corp., 330 Townsend St., San Francisco, CA 94107. (415) 541-4937.

NEW INTERNAL FAX/MODEM FROM CPI

Computer Peripherals, Inc. (CPI) has developed Hook-UP 96/24, a half-card combining a 9600 bps fax with a 2400 bps internal modem. This card sends and receives fax messages, as well as doubles as a Hayes-compatible 2400 bps internal modem. It will automatically detect whether an incoming call is addressing the fax or the modem. The unit comes with both fax and modem communication software. When the modem operates in background mode, delayed transmissions are permitted, and bulletin board operations can be used. ($495) Computer Peripherals, Inc., 667 Rancho Conejo Blvd., Newbury Park, CA 91320. 1-800-854-7600.

continued on page 110

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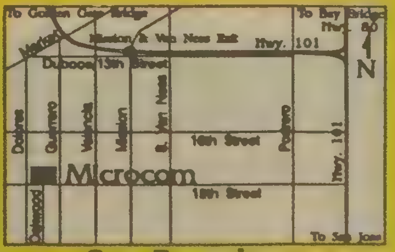

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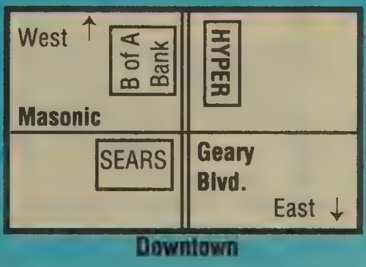

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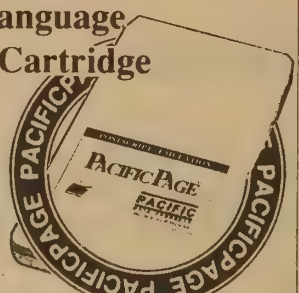

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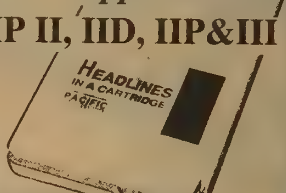

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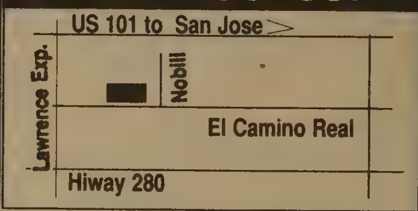

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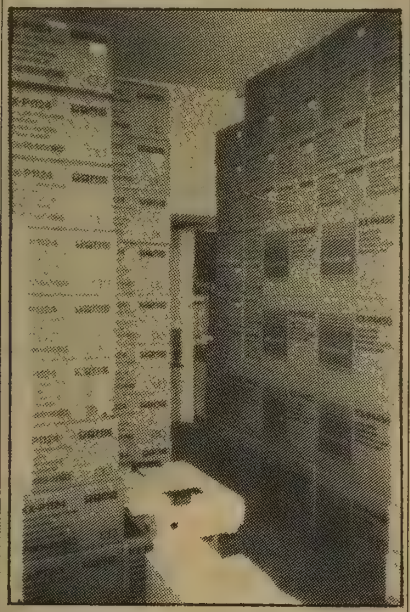

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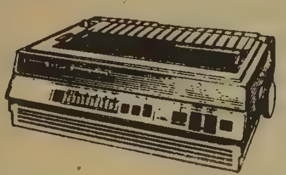

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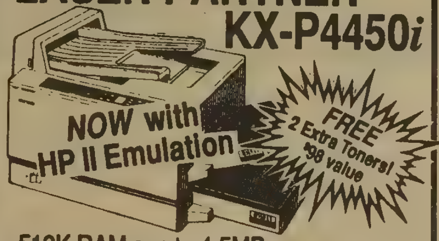

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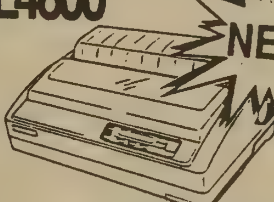

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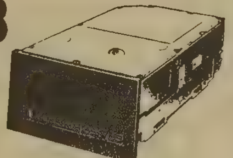

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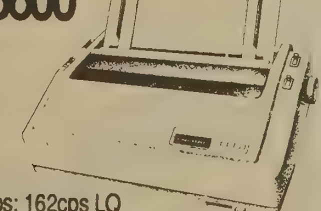

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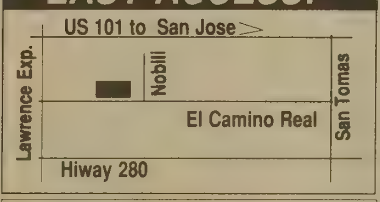

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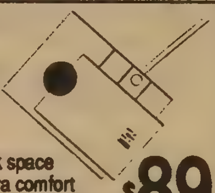

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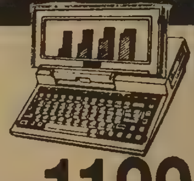

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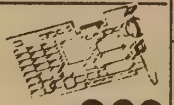

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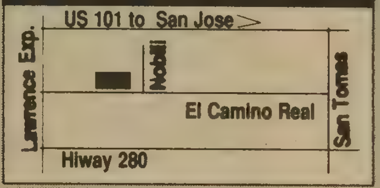

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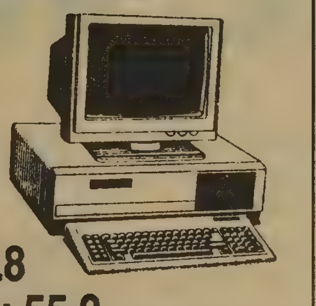

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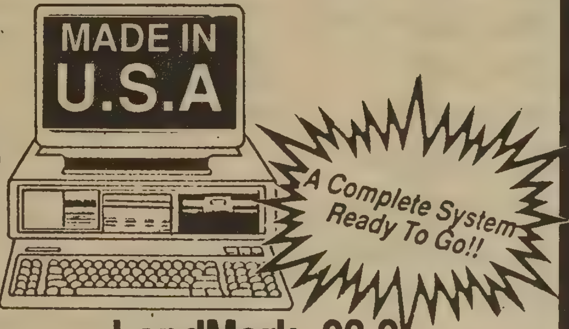

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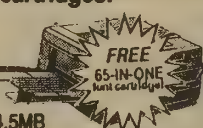

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continued from page 100

Reviews

> **This book is really a help, whether you use it as your introduction to Harvard Graphics, or as a refresher reference as I do. If the book gives you ideas on some clever display tricks from the program, you've won a great deal. This book should be in every library, and could benefit every user**

BOOKS

MASTERING HARVARD GRAPHICS

By: Glenn H. Larsen
Published By: Sybex
Suggested Retail: $24.95
Reviewed By: Robert D. Athey, Jr.

A friend gave me Harvard Graphics (from Software Publishing in Mountain View) two years ago as his parting present when he left town. Although I thought highly of him before he left, his star rose even further as I used the program to make up slides for presentations to national scientific meetings. The program is well documented and easy to use; nonetheless, this is a useful book.

Published early last year, *Mastering Harvard Graphics* is quite thorough. The introductory chapter acquaints the reader with the options available in Harvard Graphics—down to the ways to configure printers, plotters or to use subdirectories and paths. The second chapter starts with mouse operations, choosing output devices, and quick hands-on introductions to charting and graphing. Chapters three, four, and five deal with the detail of text, pie, bar and line charts, while the sixth chapter continues with fine-tuning the bar and line charts. Chapter seven discusses high/low/close and multiple charts, but I'd be more likely to use this as a demonstration of precision in analysis or test data. Chapter eight is on organization charts (also useful in flowcharting), and chapter nine describes "templates and macros"—the insiders' jargon for work-saving steps for repetitive jobs. Custom charts are dealt with in chapter ten, while information transfer (import or export) is covered in chapter eleven. The last chapter discusses slide shows—putting them into the computer, and making them do display tricks. The four appendices are references on installing the program, the devices supported, a brief review of statistics (with the program's internal commands' use in mind), and a depiction of the symbols and maps available in the program's "clip art" files.

There are special tips on how to make your drawings or charts. For instance, in drawing a freehand line, the fewer points you mark along it, the smoother the curve between the points. It also showed me why a wavy line I'd drawn had a curve under it when I hadn't put it there (at least so I thought). This book is really a help, whether you use it as your introduction to Harvard Graphics, or as a refresher reference as I do. If the book gives you ideas on some clever display tricks from the program, you've won a great deal. This book should be in every library, and could benefit every user. (Sybex Inc., Suite 100, 2021 Challenger Dr., Alameda, CA 94501, 800/227-2346)

DOS SOFTWARE

PC-WRITE LITE

For: MS-DOS
Published By: Quicksoft
Suggested Retail: Shareware—$79 for registered package (including printed User's Guide); $49 for unregistered package including User's Guide and disks; $12 for disks only with quickguide and tutorial on disk.
Reviewed By: Lenny Bailes

This slimmed-down version of Bob Wallace's PC-Write is designed for people who don't need PC-Write's more advanced text formatting features. It offers a slightly less complex menu system and is $50 cheaper than PC-Write. Lite version 1.02, due for release in mid-June, adds new support for character set customization, including a built-in Cyrillic character set and Russian spelling checker. French and German spelling checkers are available separately.

Lite takes up from 140K to 340K of disk space, depending on whether you set it up with its spelling checker and online help. This makes it a good choice for users of laptops and other limited PC systems. Lite uses 384K of memory with the spelling checker on, 256K without it.

Lite keeps the essential commands and features of PC-Write, including split-screen document editing, macros, support for footnotes and end notes and handling of non-ASCII characters. It has a simplified format key which lets the user select various margin, paragraph and page settings from a plain-English menu. The size of the documents it can handle is limited only by memory. Find-and-replace and page-through-document operations are very quick, even faster than with PC-Write. Lite also has a greeked text preview feature to let you see what pages will look like before they're printed.

Version 1.02 will allow users to remap any keys on the keyboard, and toggle between customized and standard symbol sets. With EGA and VGA monitors, you can build your own character sets and display them on-screen. A Cyrillic set is included with the program.

PC-Write features you don't get in Lite are support for proportional fonts (microspace justification), parallel columns, index and table of contents generation, and mailmerge. Registered Lite users who need these features can buy a registered copy of PC-Write for only $64. Registered PC-Write users can get Lite for $49. (Quicksoft, Inc., 219 First Ave. N., #224, Seattle, WA 98109, 206/282-0452)

WEALTH BUILDER

Published By: Reality Technologies
For: MS-DOS
Suggested Retail: $249
Reviewed By: Woody Liswood

I'm not happy with the interface and menu design of this program, which strikes me as an unsuccessful attempt to duplicate the Macintosh. Be that as it may, Wealth Builder is a significant aid in helping you plan your personal financial future.

For instance, you might run Wealth Builder before you visit your local stockbroker or financial planner, so that you have some idea of what you want to do and how you might go about doing it—before the commission vultures sell you on the financial program which generates the most commission for them, rather than the program which is best suited for your individual background, circumstance, and investment philosophy. This program can also check your financial planner's recommendation against the philosophies developed by Wealth Builder and *Money* Magazine to see if they coincide, and give you some information to discuss if the

continued on page 128

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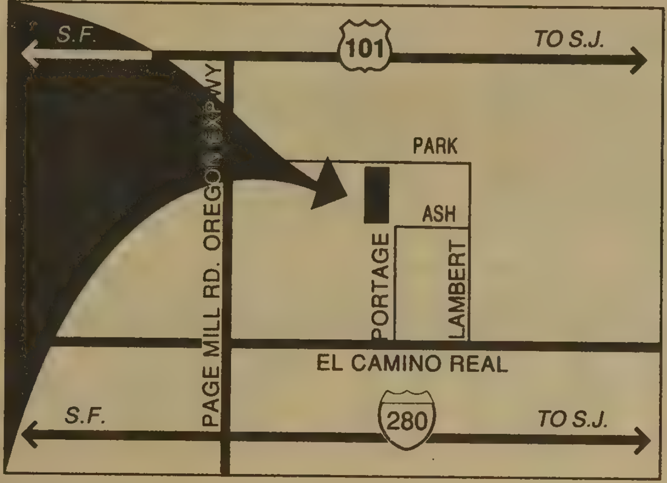

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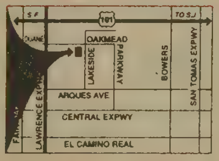

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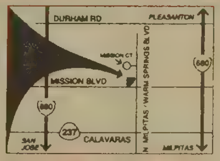

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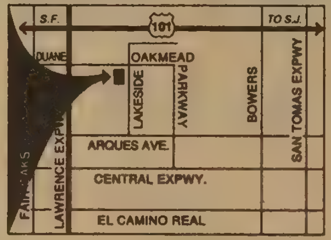

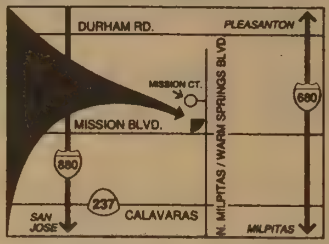

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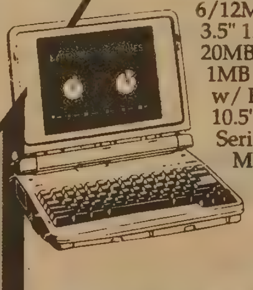

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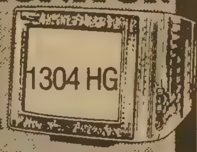

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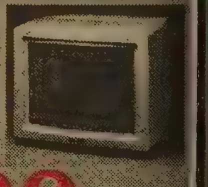

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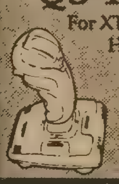

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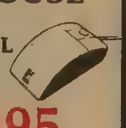

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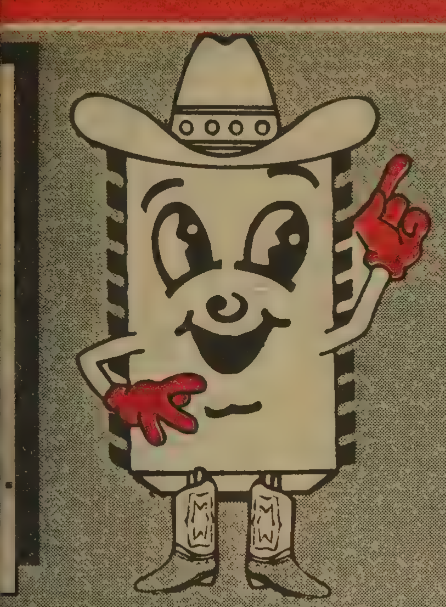

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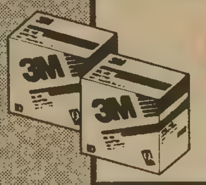

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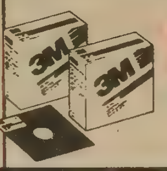

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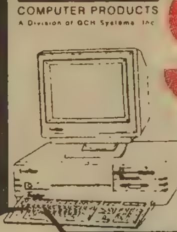

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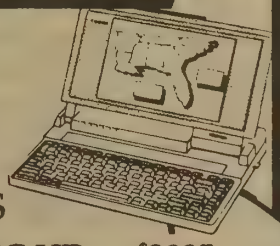

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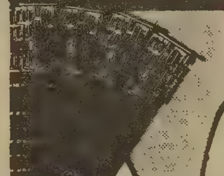

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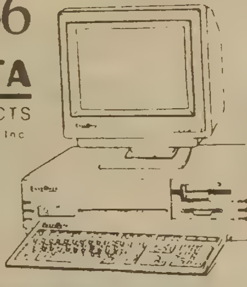

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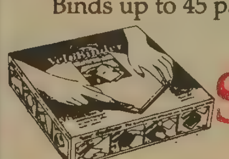

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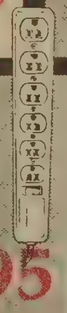

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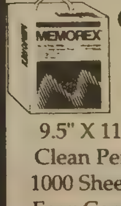

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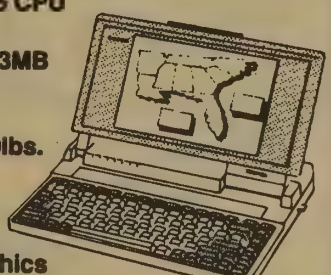

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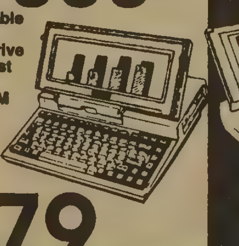

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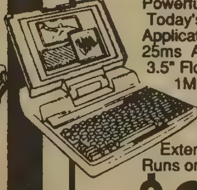

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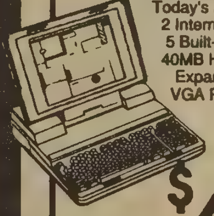

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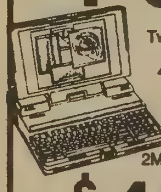

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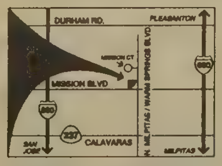

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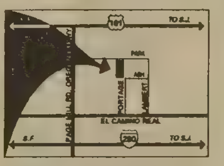

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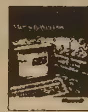

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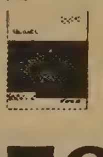

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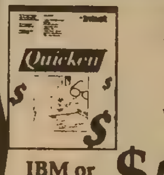

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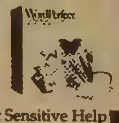

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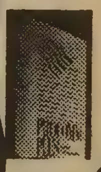

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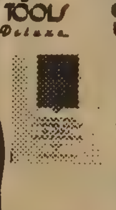

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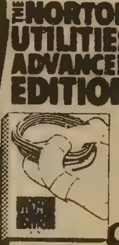

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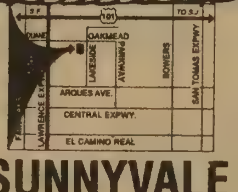

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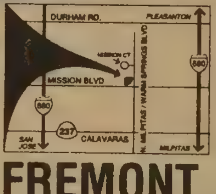

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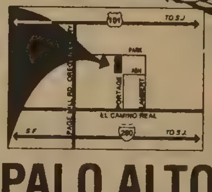

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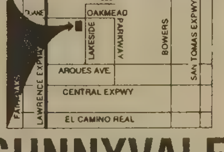

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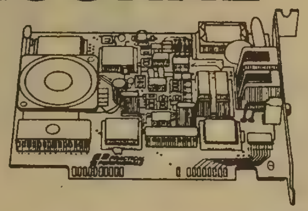

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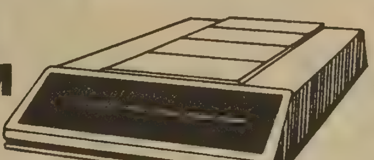

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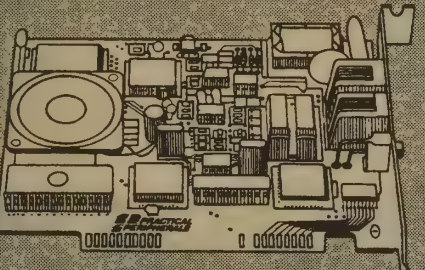

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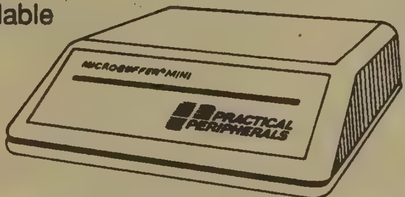

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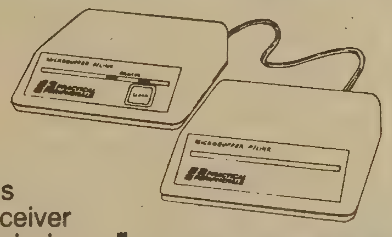

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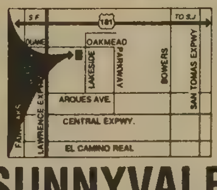

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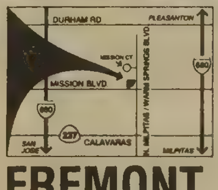

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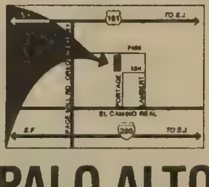

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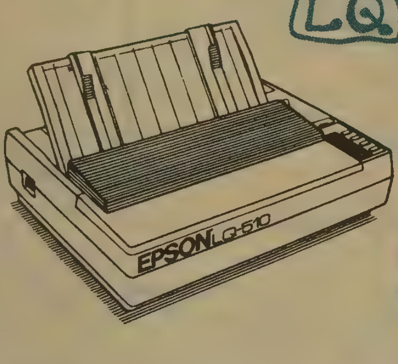

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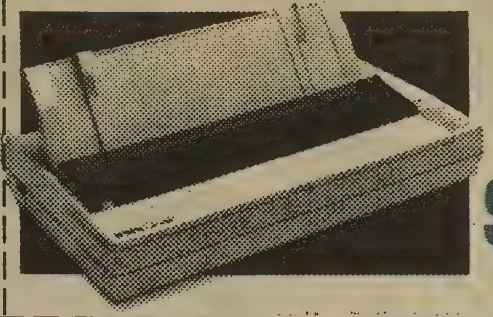

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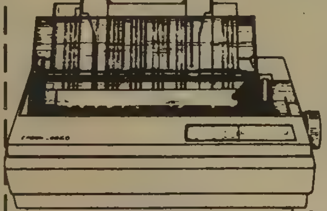

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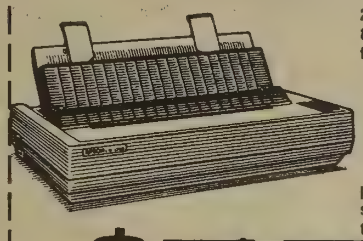

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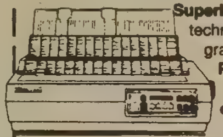

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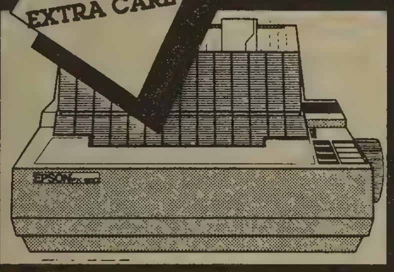

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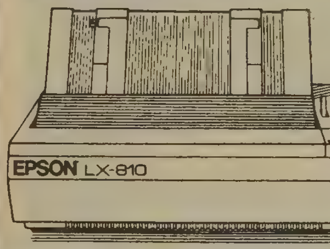

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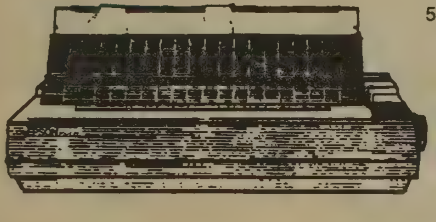

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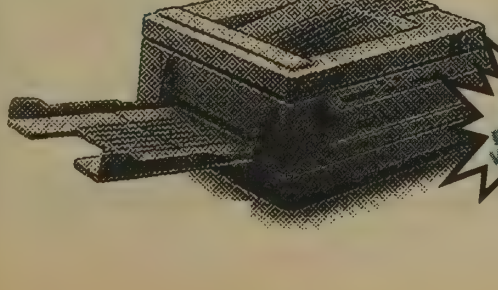

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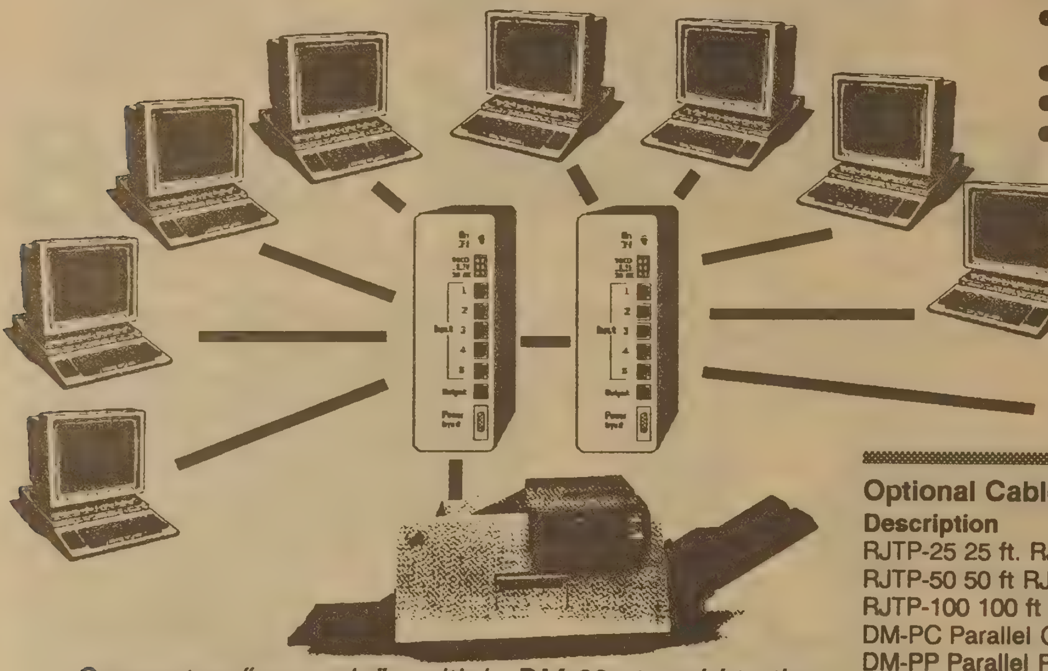

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Optional Cables and Adapters for Data Manager DM-60

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Network multiple users to multiple printers

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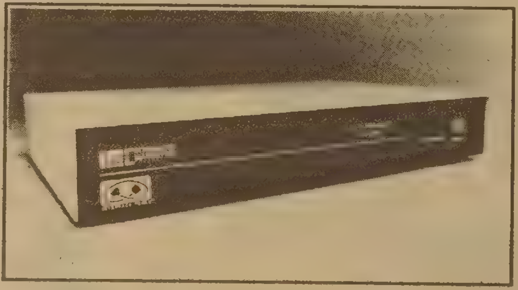

- 4 to 8-port automatic print sharing and spooling devices
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- 8-port unit connects 7 users to 1 printer, 1 user to 7 printers, or any combination of Inputs and Outputs to interconnect computers, workstations, printers, plotters, modems, etc.
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87815	DM45	6 Ser/2 Par	6 Ser/2 Par	8	$595.00	$449.00
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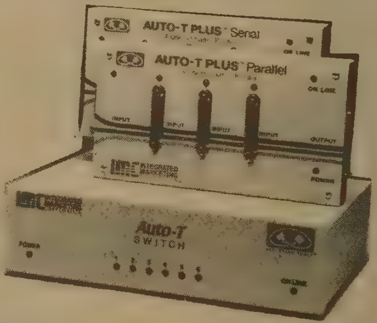

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1 Serial output port
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CCAT-P
4 Parallel Input ports
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1496697	CCAT-5	6 Serial	1 Serial	7	$195.00	$149.00
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1502158	CCAT-3	3 Ser/3 Par	1 Serial	7	$249.00	$195.00

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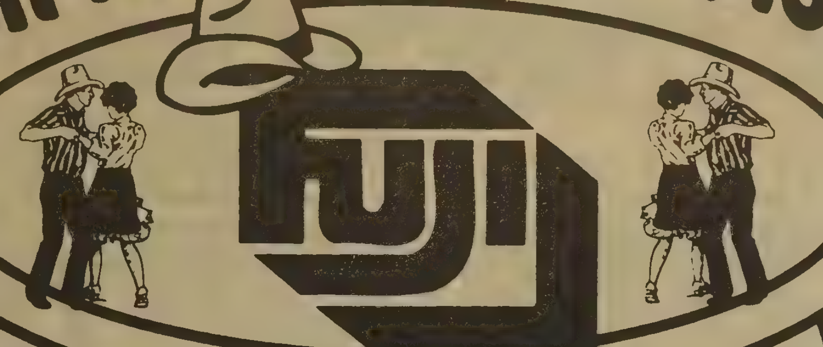

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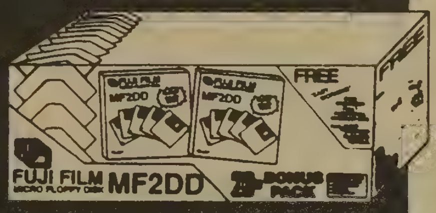

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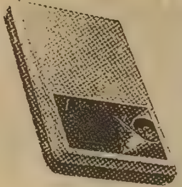

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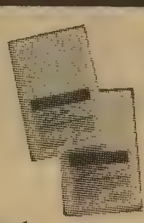

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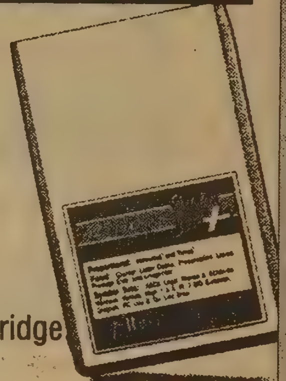

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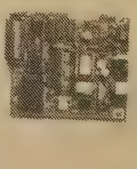

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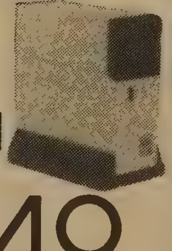

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Phone: ____________________ Other Locations: ____________________

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Specialty	Expert

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continued from page 110

The overt premise of Personnel PC is that personnel managers must use computers to be effective in the multifaceted and fast-paced environment we all face today.

recommendations differ significantly.

Wealth Builder works from a mouse-driven graphic interface. I found that I never had to look at the documentation to run the program. The documentation itself, however, is a small book labeled Users' Guide, well written and covering all of the features of the program.

The program is easy to use. When the program boots, you get a screen with three dialog buttons: one for a Money Quiz, one for a "guided tour" of the program, and one for "case studies," which lets you look at some different types of people and see how they might have entered information into the program. This screen is nice, but it appears each time you use the program, which gets old. If you are short of disk space, there is no way to eliminate all of the files associated with the first two of the menu items.

The main program gives you a blank screen with a series of pull-down menus across the top. Click on any one, and the pull-down menu appears. Double click on any menu item in the pull-down menu, and away you go.

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As you look at the investment recommendations, Wealth Builder splits your potential portfolio into Equity, Bonds, Precious Metals and Cash Investments. It also uses both taxable and tax-deferred investments. When you examine your potential portfolio, a double click at the equity mark brings you a list of the mutual funds which Wealth Builder feels meet your investment strategy. You can then look at their past history and speculate on their future results—with the caveat that past performance of any particular mutual fund does not say anything about future performance. You can also purchase mutual fund database updates, so that Wealth Builder always uses the most recent information for speculation.

Wealth Builder is a great help in planning, setting, and attaining your financial objectives. It is easy to use, and supplies you with significant amounts of information. (Reality Technologies, 3624 Market St., Philadelphia, PA 19104, 215/387-6055)

PERSONNEL PC

Published By: ASPA (American Society for Personnel Administration)
For: MS-DOS
Suggested Retail: ASPA Members $195, non-members $225, plus shipping/handling
Reviewed By: Woody Liswood

As a Human Resource manager, do you worry about how to analyze and use all that data you have about your employees, and the fact that you haven't had the time to learn the techniques you hear about from your colleagues? If so, Personnel PC may be just what you need.

The overt premise of Personnel PC is that personnel managers must use computers to be effective in the multifaceted and fast-paced environment we all face today.

The authors, George Milkovich and John Boudreau, both of Cornell University, have created ten situations which can be analyzed using mathematics. Using a case study approach, they have also had the solutions to these exercises compiled as a series of macro-driven spreadsheets. In this way, you can learn to use these techniques without also having to know how to use or develop a spreadsheet. You get the look and feel of working within a spreadsheet and using the computer, while not having to key in any formulas.

The covert premise of Personnel PC is that after working through these exercises, you will be computer literate and can use these techniques whenever they're appropriate in your organization.

Each of the exercises is presented as a case study. After reading the case and the discussion of the math needed to analyze the data, you would turn to the Personnel PC program and select the appropriate exercise from a menu that lists all of the cases from the workbook. Each exercise appears with data, so you can see how the model works and what it does. Then you key in the appropriate data from the workbook to solve that case. You can make a printout of the solution at any time.

The workbook is excellent and the discussions are lucid. I've been teaching Human Resources and Compensation at the university level since 1976 and I would have welcomed these cases and exercises as teaching materials. In fact, I use and teach similar ones today. The concepts are sound; the formulas and analysis techniques are what is considered standard practice for a compensation professional.

The ten modules are: Using PCs in HR Management; Employee Planning; Recruitment Planning; Internal Selection and Career Planning; Training Program Cost-Benefit; Labor Contract Costing; Merit Pay Increase; Benefit; Human Resource Strategy; and EEO.

Each module contains examples of how to use data to analyze and solve problems in each arena. After you understand the concepts and see how the computer solves the problem for you, you are encouraged to adopt the model for use in your own organization.

It is at this point that the system weakens. While you can get printed reports out of the program, there is no way to set up for your particular printer. If you're like me and use the ubiquitous HPLJII, you will get poor spacing and extraneous characters printed on the page. Also, since Personnel PC seems to be a compiled set of Lotus 1-2-3 spreadsheets (my opinion after viewing the program, rather than something stated anywhere), there is no way to modify the column or row headings or formulas to fit your specific organization.

I would purchase this package just to get the workbook. The explanations of the models and formulas are as good as you will get. If you understand them, you should sit down at your own computer and enter the basic model into it. If your model then duplicates the Personnel PC models, you then can modify it to fit your real-world case.

This is an excellent learning tool; not, in my opinion, to learn about computers, but to learn how to analyze data which we in human resources have at our fingertips, and to use this analysis in our decision-making process.

My only complaint is that there is not a row-and-column formula printout for each model, so you could see how the concepts expressed in the cases are actually expressed in developing the spreadsheet. (ASPA American Society for Personnel Administration, 1-800/444-5006)

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Reviewed By: Woody Liswood

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continued on page 146

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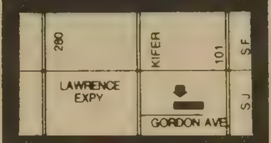

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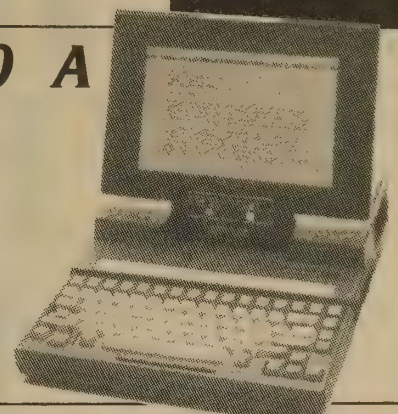

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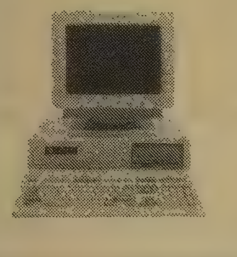

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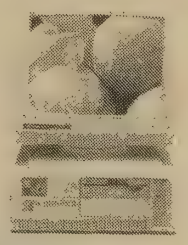

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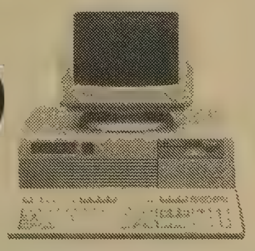

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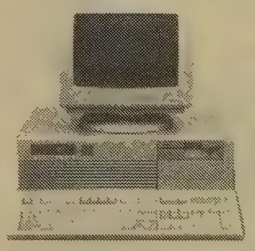

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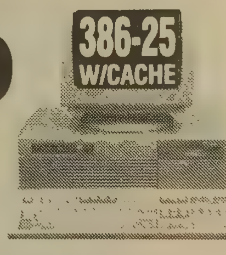

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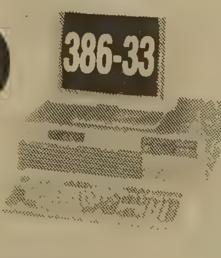

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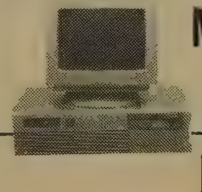

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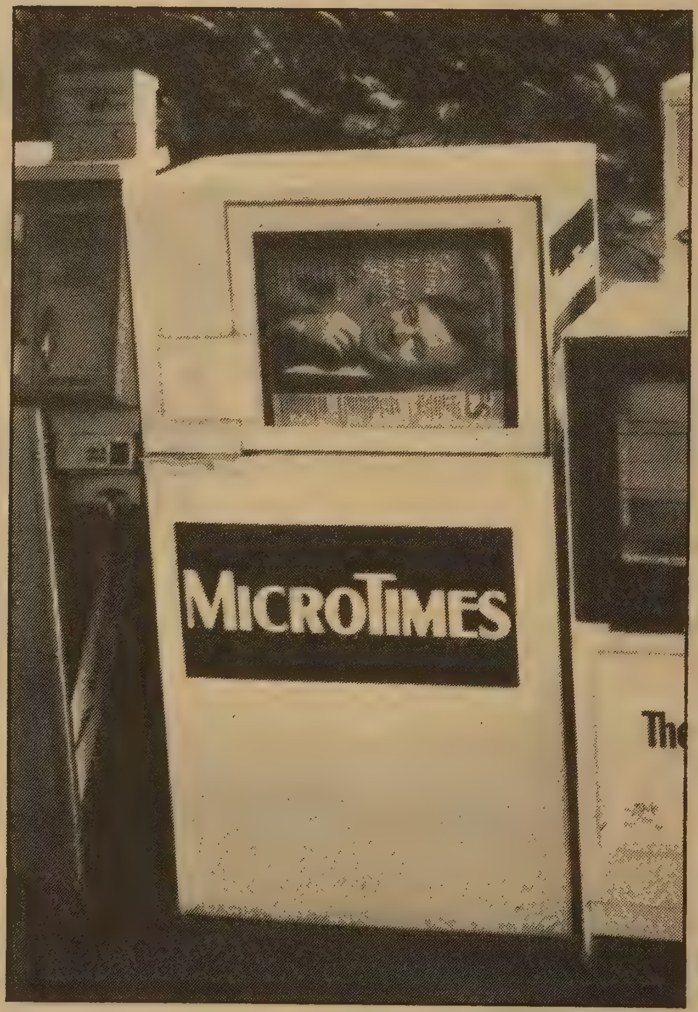

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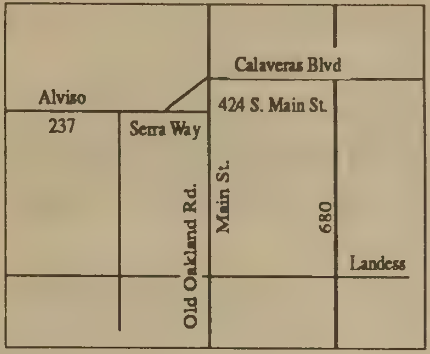

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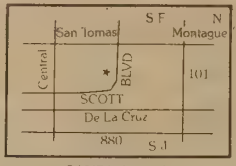

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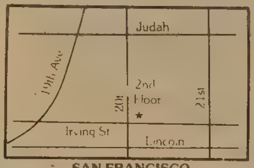

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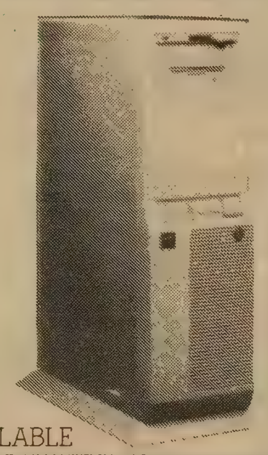

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- Real Time Clock/CMOS Memory w/Battery Back Up
- 101 Key Keyboard
- 200W Power Supply
- Deluxe Case

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- 40 MB Hard Disk
- 1.2 MB Floppy Drive
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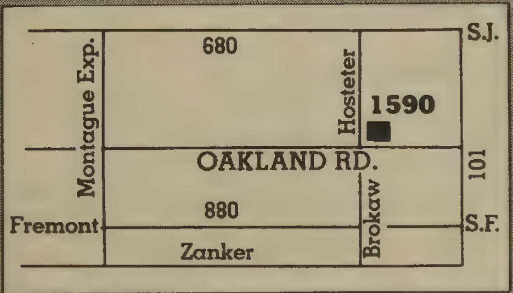

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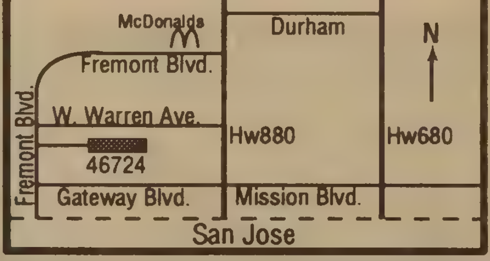

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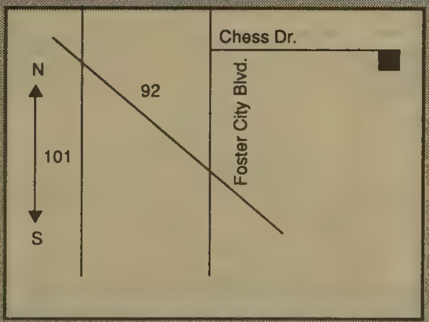

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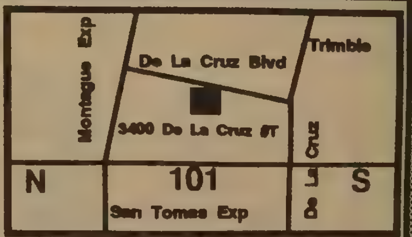

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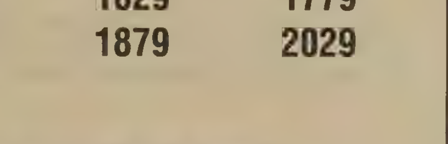

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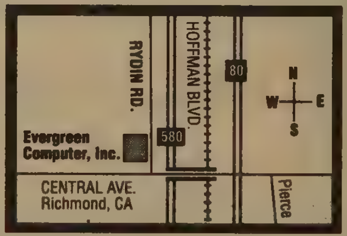

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The KX-P4420 laser printer. A powerful business printer at an affordable price—All it took was Panasonic.

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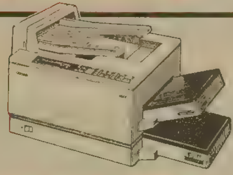

Laser Partner
KXP-4450

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- 300 DPI resolution
- 5 printer emulations
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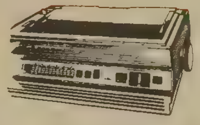

KXP 1124 •192 CPS, 80 COL, 24-PIN
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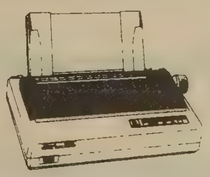

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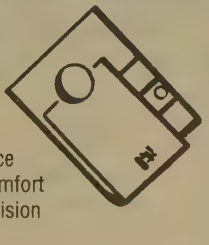

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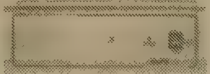

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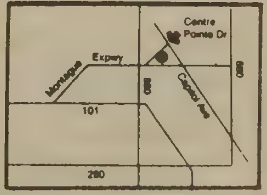

PRODUCT SPOTLIGHT

continued from page 128

color from a VGA board but been put off by the price? Or the complicated jumpers, switches, and whatnot that VGA boards all seem to require? Well, fear no more. The Hercules VGA board is here.

This is a no-frills board. You put it into your XT, AT or compatible, and away you go. It does, however, require that your monitor accept analog input. Also, if you have an IBM PC from the old days, 1981-1982, you may need to get a new BIOS. The BIOS should be dated after October 27, 1982. If you are not sure, the Hercules VGA comes with a program to check the date of your BIOS chip.

Hercules claims 100% compatibility with the IBM VGA standard. In testing the board, I could not find any program or combination of programs and hardware which would not run.

The price is certainly right. So, if you want VGA, and don't want to spend mega-dollars for your board, this might work out well for you.

(Hercules Computer Technology, Inc., 921 Parker St., Berkeley, CA 94710, 415/540-6000)

GAME REVIEWS

By Mike Markowitz

RAILROAD TYCOON

Designed By: Sid Meier
Published By: Microprose
For: IBM PC and compatibles
Requires: 512K (640K in VGA mode)
List Price: $54.95

Veteran board game players may remember a classic British import called "1830." It was a deep and beautiful simulation of the early days of railroad building in England. Now Microprose has brought the same experience to the small screen with Railroad Tycoon.

The game offers players a choice of four different "worlds": England in the 1820s, the Eastern United States in the 1830s, the Western United States in the 1880s, and Europe in the early 1900s.

The design successfully integrates many different activities and levels of play—financial wheeling and dealing, right-of-way planning and construction, the purchase and management of rolling stock, and the dispatching of individual trains.

The beautifully colored game maps allow you to zoom from a continent-wide view, down to the details of a local region. Color is required, and a mouse is strongly recommended. There are delightful animated sequences when you build a bridge (and when one gets washed away). The game communicates information in many ways; for example, by flashing headlines from the "Railroad Times" or by presenting annual balance sheets.

Railroad Tycoon is lavishly documented, with a history-packed 180-page manual, a technical supplement and two laminated cards that diagram the intricate resources and economies of the game. A helpful tutorial

continued on page 150

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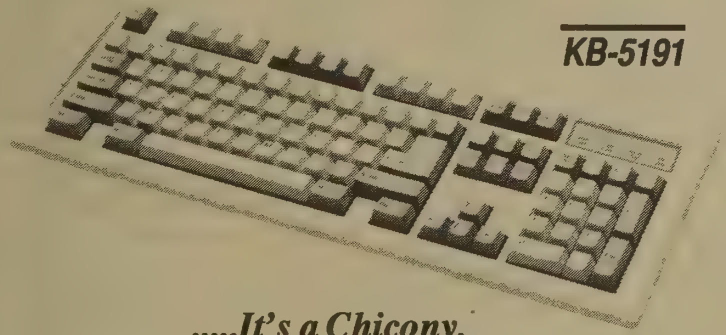

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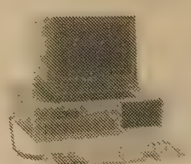

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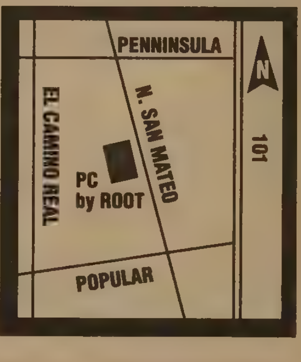

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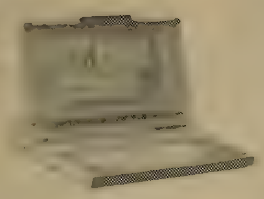

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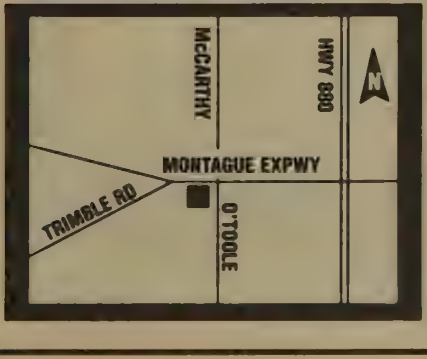

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continued from page 146

Even those who never played with toy trains and never considered themselves "railroad buffs" may be glad to have a top-quality computer simulation that doesn't involve killing anything, or blowing anything up.

smooths out the steep upgrade of the game's learning curve (I think I can, I think I can....). Even those who never played with toy trains, and who never considered themselves "railroad buffs" may be glad to have a top-quality computer simulation that doesn't involve killing anything, or blowing anything up.

We're only halfway through 1990, but Railroad Tycoon is a shoo-in for a Game of the Year nomination. I can only hope that Microprose follows up with a Macintosh version, so that MS-DOS users won't have all the fun.

SOLITAIRE ROYALE

Published By: Spectrum Holobyte
For: Macintosh, Apple IIGS, IBM PC and compatibles
List Price: $39.95

In our culture, solitaire card games have a long-established reputation as relaxing pastimes. This computer implementation of eight different variations on solitaire is no exception. In fact, this is the most soothing computer game I've played since Shanghai—which is not surprising since the Mac version was done by the same brilliant programmer, Brodie Lockard.

The games are called Pyramid, Golf, Klondike, Canfield, Corners, Calculation, Three Shuffles and a Draw, and Reno. The one called Klondike here is the classic game of Solitaire, also known as Patience. Several of the variations are extremely difficult to win, but still fun to play. There are also three very simple children's games: Pairs, The Wish and Concentration.

The Apple IIGS version was programmed in 65816 assembly language, and includes excellent digitized sounds for the shuffle and snap of the cards. You can customize the background color, and select from a variety of different card deck designs. For the incurable competitor there is even a Tournament mode that lets you keep score while playing against an opponent (who receives exactly the same deal of the cards).

WOLFPACK

Designed By: NovaLogic, Inc.
Published By: Brøderbund
For: IBM PC and compatibles (512K; VGA, EGA, Tandy, CGA or Hercules video)
List Price: $54.95

This intricate and beautiful simulation of World War II submarine combat in the Atlantic will appeal to anyone who loved the film *Das Boot.* In 256-color VGA mode, the game is visually stunning, with somber graphics that use sophisticated anti-aliasing to boost the apparent screen resolution. The targets seen through your periscope are richly detailed, and they look and move like ships—not the crude polygons we've gotten used to in similar games.

The game's sound effects are compatible with the AdLib, SoundBlaster and Tandy stereo audio cards.

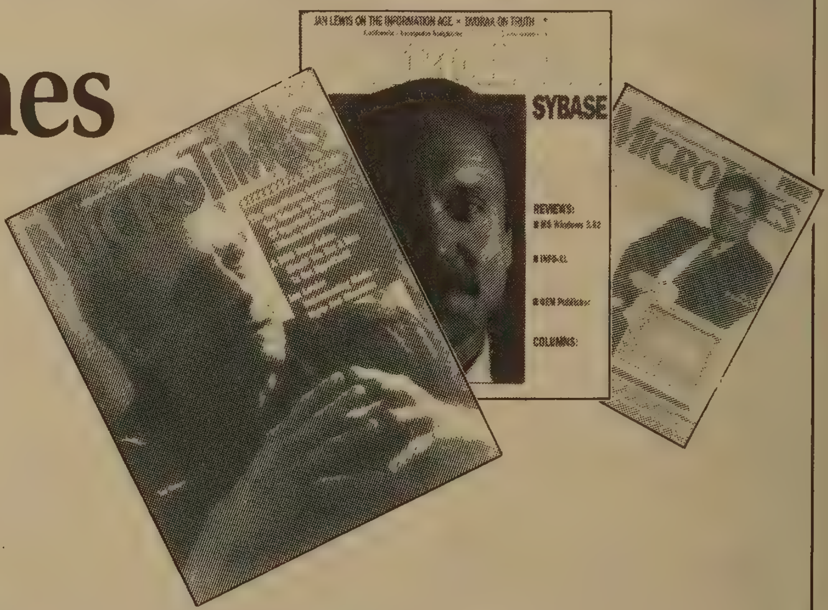
You can take the role of the submarine captain, or the skipper of a destroyer; a mission construction set lets you create your own scenarios, from any year of the war. The computer can take either side, or you can have two human players. You can also command an entire German Wolfpack, or Allied convoy, selecting individual ship captains based on their personalities and probable responses.

The mechanics of search and combat are slightly simplified (in reality, computing the lead angle for a torpedo shot is very tricky, but

continued on page 153

No Other Magazines Were Mentioned!

That's right! In a recent survey, the Copley Newspaper Group asked computer retailers in California, "What Magazines Were Most Popular With Their Customers?"



Here are the results:
1. PC Magazine
2. Byte
3. MicroTimes
4. MacUser
5. MacWorld
6. Lotus
7. Infoworld
8. Newsweek
9. Time

That's it. No other magazines were mentioned. Computer hardware and software retailers in California agree—there's only one local magazine their customers depend on. MicroTimes.

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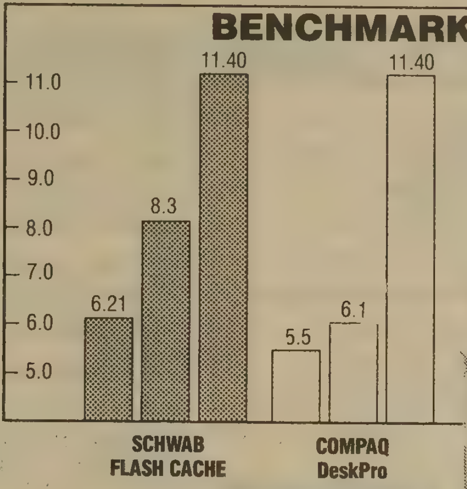

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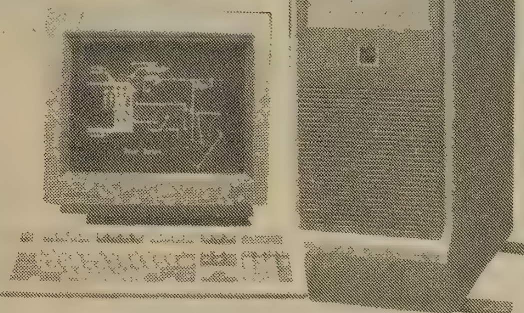

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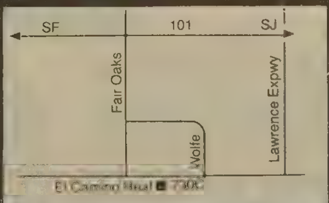

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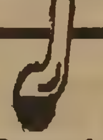

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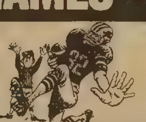
GAMES



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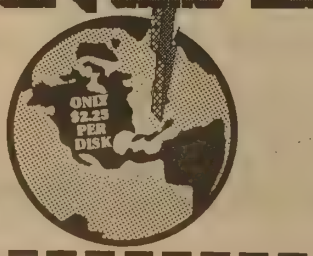

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Gimme a break. Not another low-fidelity combat flight simulator to cash in on the waning popularity of Top Gun and its tedious imitators....

Hold on there. At least this one has some good ideas.

in the game you just aim and fire). Battle damage is modeled very realistically, system by system. The game also allows the rather difficult mission of refueling and rearming a submarine at sea (the Germans used special resupply U-boats called "milk cows").

The 90-page manual is illustrated with historical photos and packed with technical information and tactical hints. The game uses an "off-disk" copy protection scheme that requires you to hunt down a particular word in the manual and enter it accurately in order to start play. An installer makes it easy to copy the program's two floppies onto your hard disk. I would not recommend Wolfpack for any player without at least an EGA video monitor (VGA preferred!).

STRIKE ACES

Designed By: Andy Craven, Ciaran Gultnieks, Ian Martin
Published By: Accolade
Requires: IBM PC or compatible (512K, 8MHz or faster recommended)
List Price: $49.95

Gimme a break. Not another low-fidelity combat flight simulator to cash in on the waning popularity of *Top Gun* and its tedious imitators....

Hold on there. At least this one has some good ideas. It's based on the annual international competition for the Curtis LeMay Trophy, a sort of Olympics of precision bombing and navigation held at Ellsworth Air Force Base in South Dakota. You can actually buzz Mt. Rushmore, and some missions require in-flight refueling (an incredibly difficult thing to simulate well—bravo to the design team!).

You choose one of six different strike aircraft: F-111F, Panavia Tornado, F-15E, F-4E, MiG-27 or Saab Viggen. You select your armament from an extensive menu of different bombs, missiles and rockets. You can also choose an opposing interceptor: F-14 Tomcat, F-16 Falcon, F-5E, MiG-29 Fulcrum, Mirage 2000, or SU-27 Flanker.

The game has a very well-designed installation program, with the video graphics drivers (CGA, EGA, VGA) on separate disks, so you only install the one you need. The copy protection is based on a code-wheel included in the package—it's loosely based on the authorization codes used to arm actual weapons.

The cockpit interiors are modeled as detailed bit-map graphics, and the view out of the canopy is modeled as a series of simple polygon fills. Keyboard and joystick input are supported, but I cannot imagine anyone enjoying any flight simulation with only the cursor keys for input.

The package modestly suggests a minimum CPU clock speed of 8MHz.

You can balance the speed of the game against the speed of the computer by selecting different levels of graphic detail during installation—this is a very smart feature that more PC game publishers should include in their designs.

The 64-page manual is required reading before you start playing. A quick reference card or keyboard template would have been helpful, but you can't expect everything in a modestly-priced simulation. An Amiga version should be shipping by the time you read this. ■

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Landmark = 20.6 MHz
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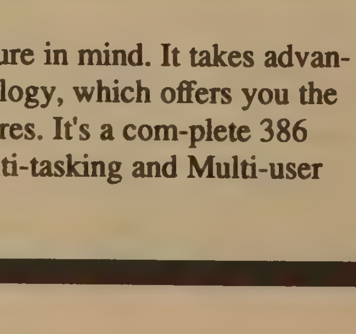
- Tactile feel keyboard, 101 key-style KB
- Video Card and Monitor Extra



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The Hit of 1990

Landmark speed 117 MHz MIPS 11.9

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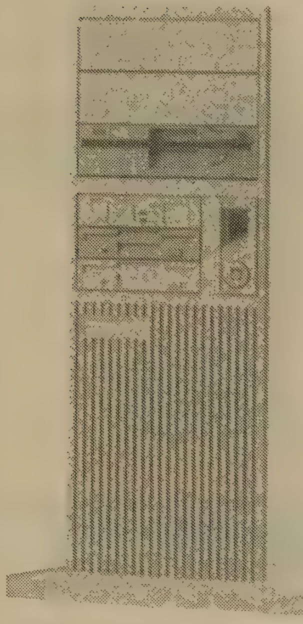

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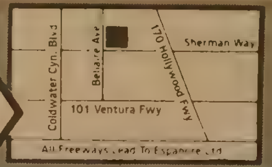

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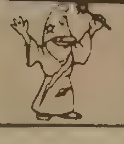

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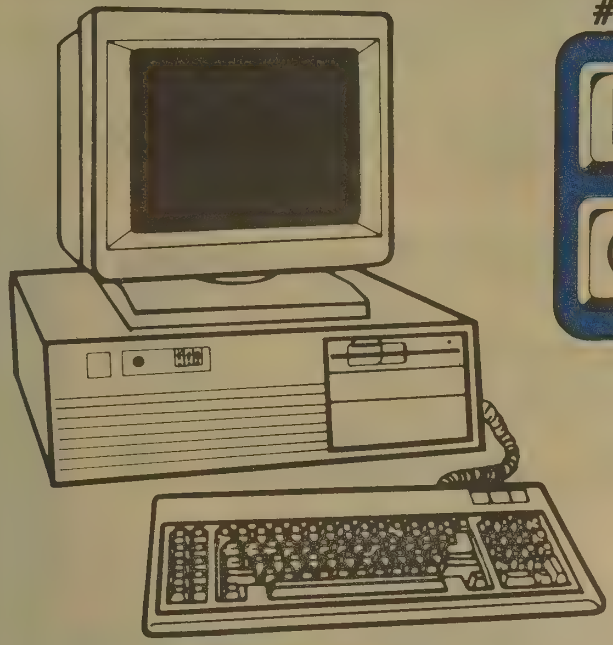

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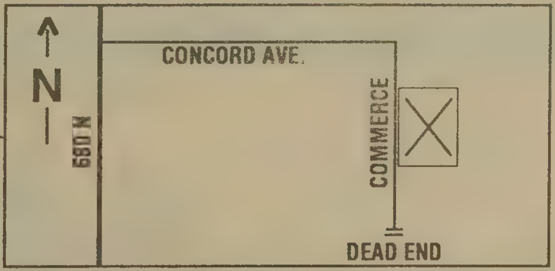

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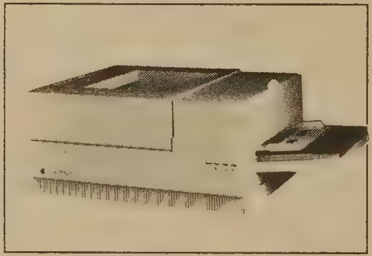
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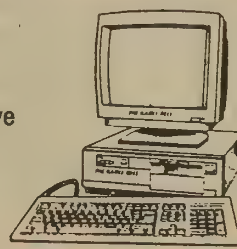

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MOUNTAIN VIEW

continued from page 44

x number of transactions per month you need software in the $300 to $600 range," or "if you need job cost or inventory, you need to look at accounting packages in the $600 per module and up range." (Of course every rule has its exception. If you need accounting software that runs on a network, you probably need software in the $600 per module and up category, although DacEasy has recently introduced a network package.)

Typically, the more expensive the software, the more likely it is that it will do exactly what you want it to do, and the more likely it is that it will be difficult to set up and learn. Software that can be tailored to fit many different situations must have various options set up just right in order to get the results you want.

With less expensive software you will probably have to change some aspect of your business to accommodate the software. For example, it is unlikely that less expensive software will produce client statements that look exactly like the ones your secretary types now. Less expensive software typically has a standard format for statements, which cannot be changed. If you aren't willing to change the format of your customer statements to the format produced by the software, you may need to look at more expensive software which will allow you to set up customer statements the way you want them to look.

If you pay commissions based on sales, you'll need to know the total amount of sales for each salesperson. To get this information with less expensive software, you may have to set up a separate sales revenue account for sales generated by each salesperson. This contrasts with more expensive software, where you will only need a single sales revenue account.

Another example of changing your business practices to fit the software involves the number of lines per invoice that the system allows. If the system will only allow 20 lines per invoice and you have customers who often order 45 items at a time, are you willing to generate three invoices per 45 item order, or do you absolutely want a single invoice per order? If you want a single invoice per order, you need to keep on looking.

With less expensive software, you often have to rely on setting up accounts to collect the data you need. For example, if you pay commissions based on sales, you'll need to know the total amount of sales for each salesperson. To get this information with less expensive software, you may have to set up a separate sales revenue account for sales generated by each salesperson. This contrasts with more expensive software, where you will only need a single sales revenue account; on the screen where you input the sale, you simply tell the software that salesperson number 6789 should earn a 2% commission on this sale. The software will then generate a sales commission report for you at the end of the period.

Of course, in these three examples the more expensive software sounds much better. However, keep in mind that more expensive is not necessarily better, and, conversely, that less expensive is not necessarily a better deal. What is of utmost importance is that the software fits your particular needs. Going back to the example of the sales commissions, if you only have three salespeople, it may not be worth spending several thousand dollars more in order to get a sales commission report, when setting up three sales accounts will do the job.

ISSUES TO CONSIDER

When you start looking at different software packages, consider the following:

- Do you like the "feel" of the software? Compare a few different packages.
- What kind of telephone support does the software vendor provide to the user? A few vendors provide free or low-priced support, while others charge hefty prices.
- Are the screens functionally the same? Every screen should function the same way as every other. For example, you don't want to have to use the escape key to leave one screen, and Q to leave another. This sort of thing makes software awkward to use and indicates poor design.

Typically, the more expensive the software, the more likely that it will do exactly what you want, and the more likely that it will be difficult to set up and learn. Software that can be tailored to fit many different situations must have various options set up just right in order to get the results you want.

- What "add-ons" are available? Some accounting packages that have been around for a while offer third-party software produced and distributed by independent companies that interacts with the basic software package. "Add-ons" typically adapt the software to the needs of a particular industry.
- If the software vendor offers several levels of software, are all the products coordinated with each other? A few firms that offer several levels of software (i.e., less sophisticated, and therefore less expensive, through more expensive and more sophisticated software) have coordinated their different software products so that once a user learns one product, he or she can use other products without having to learn a completely different set of commands. This is particularly important if your strategy is to start with a product in the $300 to $600 range and move up to more sophisticated software as your business requires it. Don't underestimate the amount of time and frustration it takes to become familiar with a software package.

As you have gathered by now, there is no easy way to computerize your business. Don't be discouraged. With a little work and determination, you can have a computer system that fits your needs and works like a charm. Once you have things running smoothly, you'll wonder how you ever managed so long without it. ■

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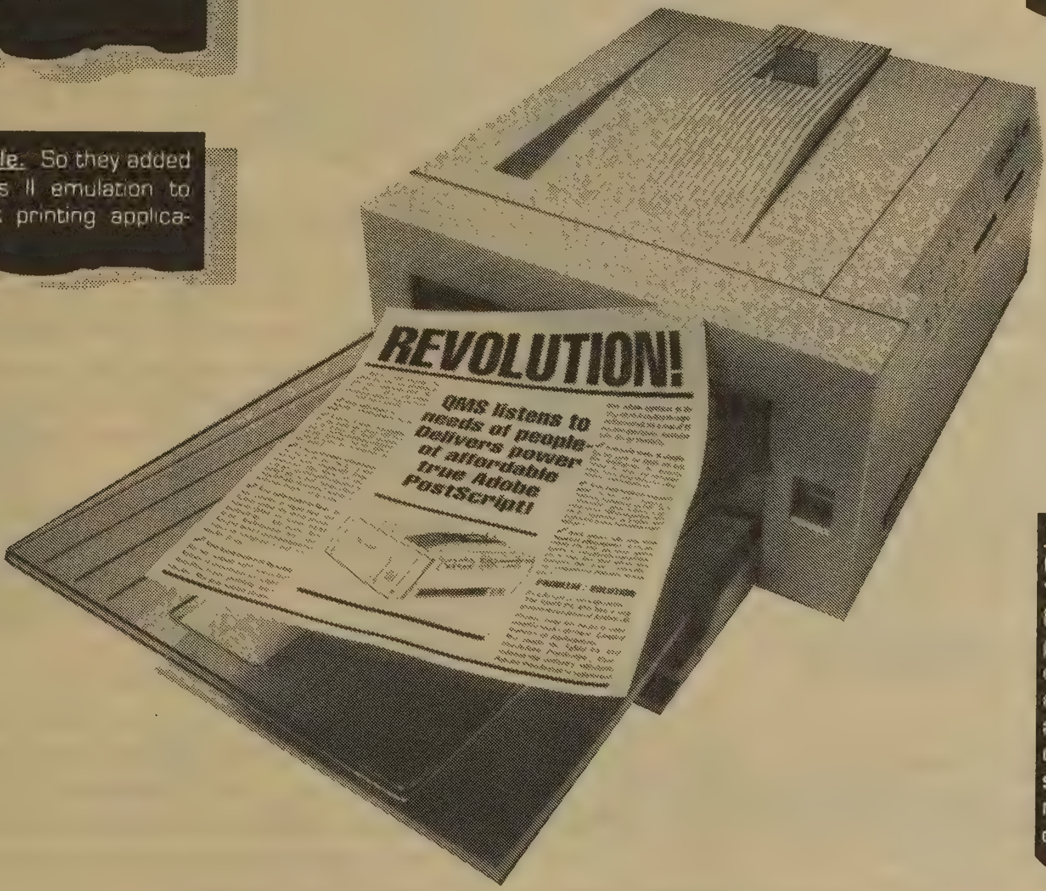
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Reality Check

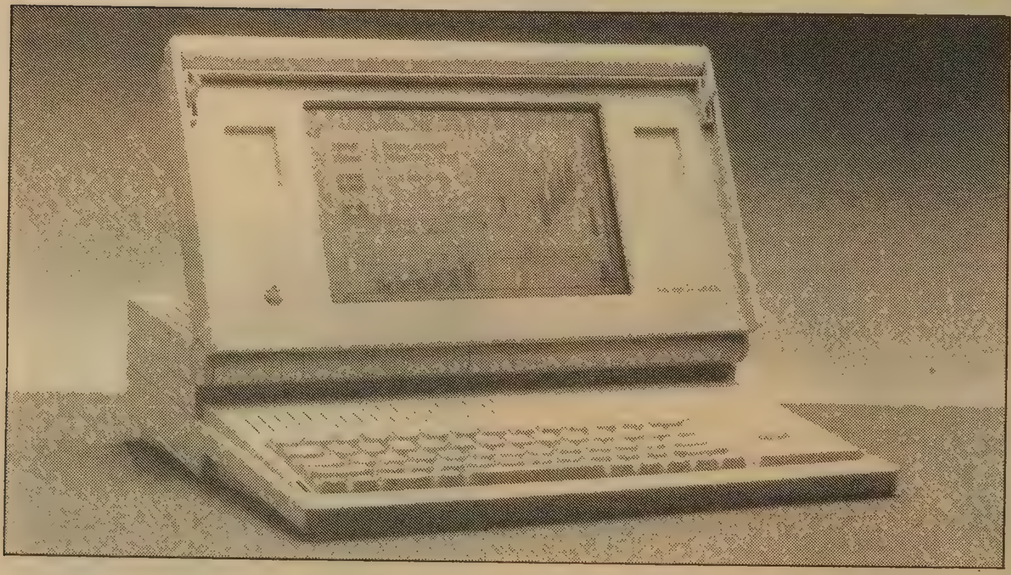
On The Road With A Mac Portable

BY MARY EISENHART

For the committed Mac user, the search for a computer to take on the road is never-ending.

True, if you're willing to sacrifice things like the interface that makes a Mac a Mac and the ability to run your Macintosh applications, you've got a lot of options, from handheld machines to sophisticated DOS-based portables. However, a significant number of us find such "solutions" unacceptable, usually for ease-of-use or application-dependent issues. If you have to show your client that FreeHand document or 4D report and make changes onscreen, or run MicroPhone scripts to download remote information, you need a Mac and that's that.

A number of third-party options exist, all of which have the considerable disadvantage of cannibalizing standard-issue Macintoshes for their vital parts and passing the cost on to the consumer. The most recent, the Outbound, takes the ROMs from an SE (to which it can be later "docked" for file transfer or desktop operation of the SE).



It's big. It's heavy. It's a true and uncompromising Mac that does real work.

On the other hand, unlike some we could mention, it fits in a briefcase.

The Macintosh Portable has been out for about a year now, and probably hasn't been the runaway success Apple would have liked. It's big. It's heavy, a fact that has apparently established itself in the Cupertino corporate culture—I recently was privileged to hear an engineer explain that "Portable" was now used as an informal unit of measure, as in "The Personal LaserWriter NT weighs one Portable less than the LaserWriter NT." Nonetheless, it's a noble effort; while future generations of Mac portables will undoubtedly be lighter and, ideally, cheaper, they would do well to retain a lot of things that this one does right.

Recently I had the opportunity to go to Japan on a press tour. I wasn't crazy about being Mac-less for a week; I had never gotten into DOS portables, and I knew that much as I love my SE/30, hauling it across Telegraph Avenue is about my limit. So I threw myself on the mercy of Apple's editorial loan department, and the next thing I knew some hapless Apple marketroid's Portable was on my doorstep.

That Portable and I had many adventures. It aroused great interest wherever it went—usually gleeful exclamations of "MACINTOSH!" followed by a horrified, "Too heavy!" and extravagant praise of NEC DOS portables, which gradually fell silent as the joys of the Mac's performance and interface became apparent.

It wound up being very useful and truly Mac-like. It's not perfect and it's probably a pretty early step along the evolutionary path, but it's also a uniquely functional tool here and now.

WHAT'S NOT RIGHT

It is not news to anybody at this point that this machine is heavy. It gets heavier when it has a hard disk. Lugging it through airports is not fun, especially if you're juggling suitcases at the same time (Apple gives you a nice padded carrying case which also holds diskettes, the power adapter, and other small items. The load gets less unwieldy if you leave all this behind). It's lighter than an Osborne 1, by way of putting it in perspective.

The Active Matrix Liquid Crystal Display, for all its sterling qualities I'll mention momentarily, is not backlit. It is, therefore, all but impossible to read in airplanes and other low-light situations. This is going to make the Mac Portable essentially useless to a significant number of potential users.

There are those who also say that it's too big. Personally, I don't find the size unacceptable compared to that of some of the more powerful DOS hard disk models to which this configuration (2Mb RAM, 40Mb hard disk) is comparable. It would be hard to imagine the full-size screen and full-size keyboard/trackball combo in a form factor much smaller, and the large screen and uncramped keyboard are among the Portable's best features.

Some say you can't really use the Mac Portable as a laptop. I used it as a laptop all the time. On the other hand, in fairness I should point out that I'm a sufficiently hardcore lap typist that I used to use Smith-

> **While future generations of Mac portables will undoubtedly be lighter and, ideally, cheaper, they should retain a lot of things that this one does right.**

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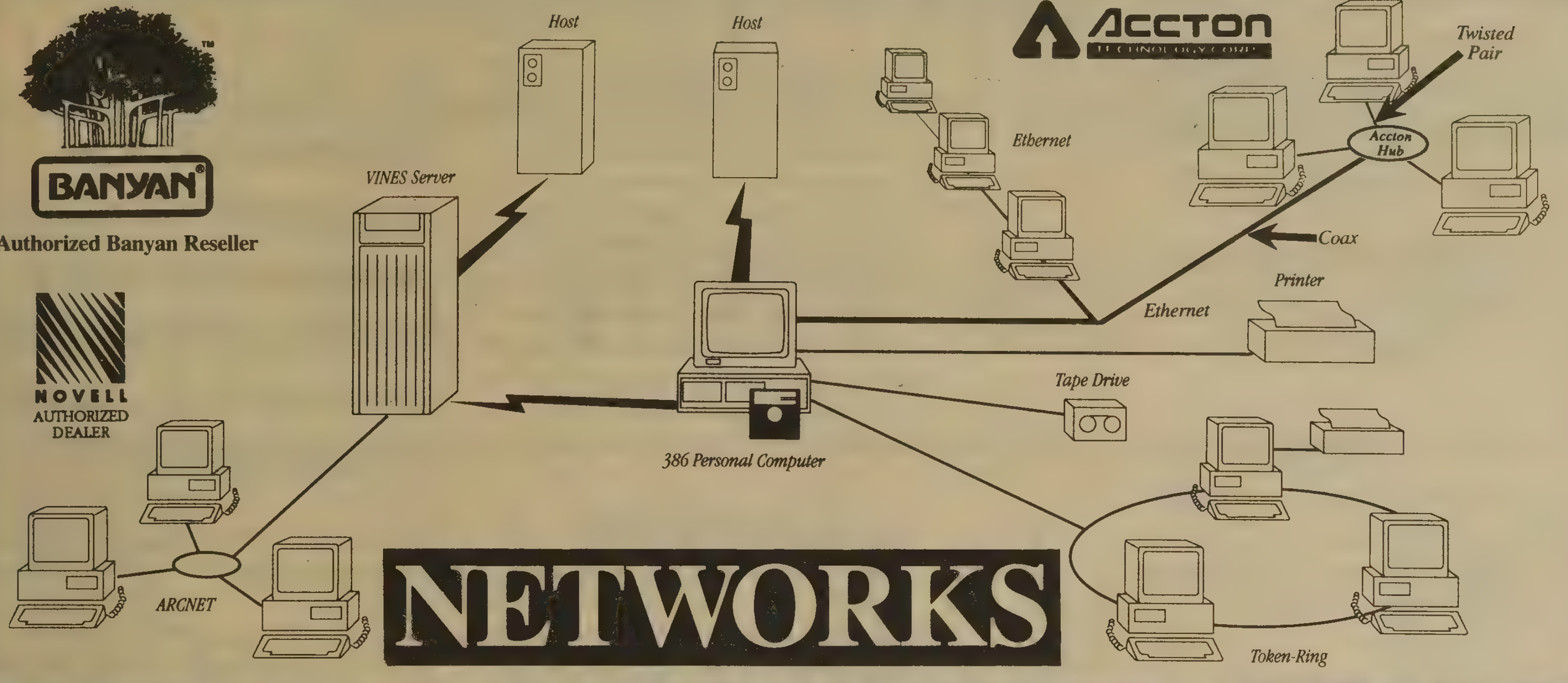

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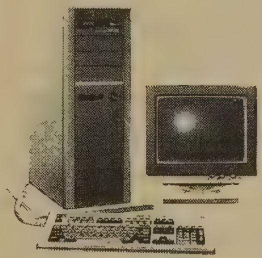

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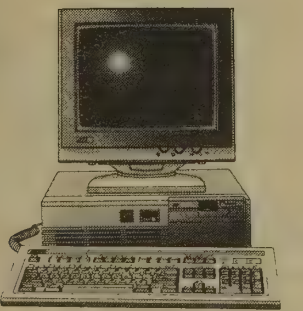

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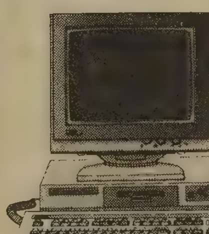

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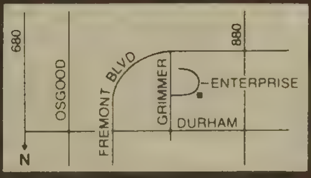

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Corona Electric Portables as laptops.

Arguments go on endlessly about the Portable's trackball—mouse emulation is one of the big design problems in making a traveling Mac, and nobody's come up with a solution that pleases everyone. I've always been pretty happy with the basic mouse and always felt awkward using trackballs, but I got used to the Portable's trackball pretty readily.

ON TO THE GOOD STUFF

That said, there's a lot to be said in favor of this machine. The problem of creating a truly portable true Macintosh is a serious challenge, and sometimes Apple seems to have made less-than-ideal choices for sound reasons.

Take the weight, which definitely strained my relationship with this machine. Most of it comes from the battery, a bricklike device usually used for video equipment. However much you curse that battery as you're hauling the machine around, you'll feel a lot better about it after you've been working six hours and you've still got power. (True, Apple should waste no time about acquiring the technology that allows a Poqet to run 100 hours on a set of AAs, but six hours is a significant improvement over what's available elsewhere, and in my experience it's real.)

And the screen. Not the high-contrast paper-white delight we've come to love on our desktop Macs, and not backlit. But sharp, precise, fast, and devoid of those ghostly trails that get so distracting on other vendors' displays. Wide enough for spreadsheets; wide enough to accommodate several open windows and switch among them in MultiFinder. Wide enough for you to keep the Battery desk accessory onscreen to monitor your power consumption (though, not unlike gas gauges, the Battery DA seems to have an erratic mind of its own). Whatever Apple does about future screens, it should not abandon what's right about this one. We don't need more fuzzy displays with vapor trails.

Other aspects of the Portable show the attention to detail and added value for which Apple often doesn't get enough credit. The SuperDrive that reads and writes Mac or DOS high density disks. The ease with which you can open the machine up, to change the batteries or satisfy the anxieties of baggage inspectors. The fact that its hard-disk configuration (unlike the similarly priced and ROM-less Outbound) also includes a floppy drive. The fact that you can attach external SCSI devices to it, a godsend if you're working with files at clients' sites (again, something the Outbound doesn't do). Although the machine I used didn't have one, the Portable will accommodate an internal modem; the Outbound won't.

The best solution for you depends on knowing your needs before you buy and figuring out what comes the closest to meeting them.

I particularly appreciated the largely unsung fact that all Macs including this one have power supplies that automatically adjust to local voltage up to 275 volts. As it turned out, Japanese outlets and voltage are pretty close to the US version and the Mac charged happily in Tokyo; it's nice to know that it would've done likewise in Albania.

For networking, printing, and other purposes, this is a fully functional and uncompromising Mac. Depending on the task involved, it may be significantly slower than your desktop Mac (you almost *feel* the battery driving the hard disk sometimes), but it will not deprive you of any of the functionality and ease of use you've come to expect.

DO YOU NEED ONE?

The perfect portable Macintosh doesn't exist yet. The best solution for you depends on knowing your needs before you buy and figuring out what comes the closest to meeting them.

If you need one all-purpose Macintosh and might have to carry it around occasionally, you'd probably do better to spend similar amounts of money and get a maxed-out SE/30 (4Mb RAM, 80Mb disk). More power, better upgrade path, UNIX capability, etc. However, it seems to weigh at least two Portables, and there's no way you can run it on batteries.

If what you need is something to take a few notes on now and then, move a few files around, and do some telecomm, you'll probably be able to put something fairly economical together with, say, a Tandy portable and LapLink Mac. While you'll have a lot more fun doing it with a Mac Portable, you'll also spend a lot more money.

But if you need those Mac applications, and have to carry a Mac around to various work sites, your options become few, expensive, and fraught with tradeoffs. Within this context, the serious Mac user will find the Mac Portable worth a good look, and quite possibly worth choosing over its competition. ■

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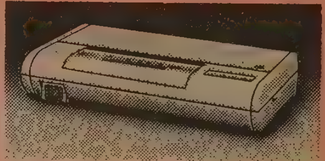

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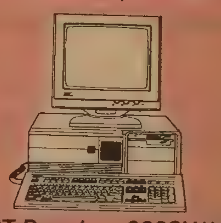

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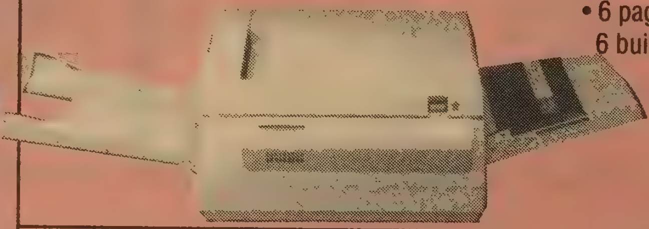

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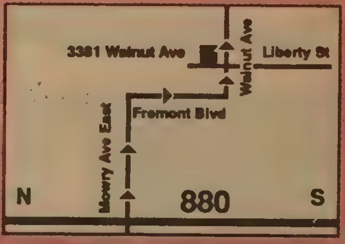

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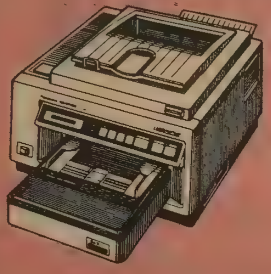

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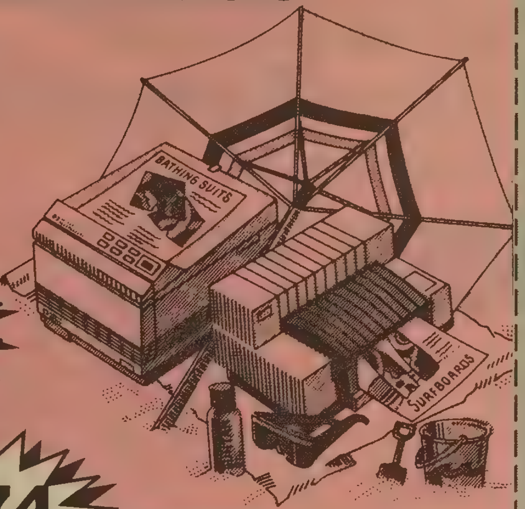

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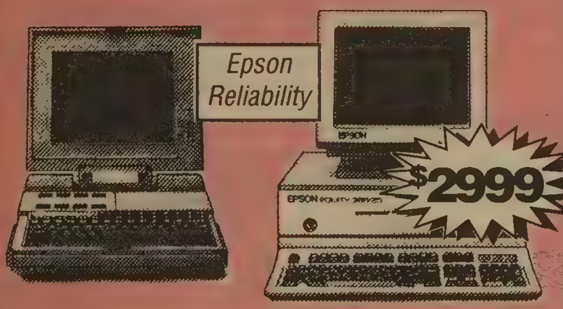

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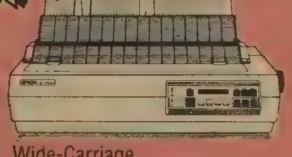

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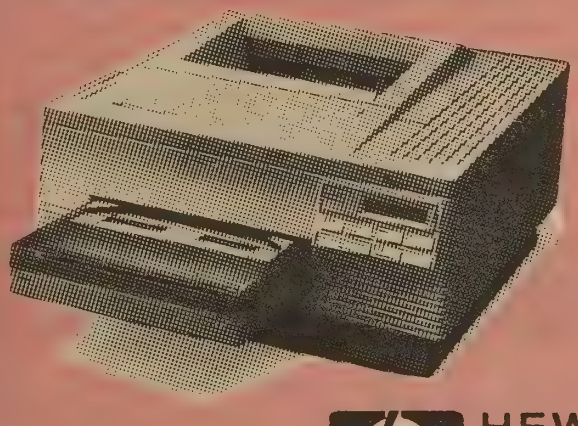

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Diagnostic Software For A Trouble-Free Installation

BY WAYNE A. YACCO

This is the second in a series of columns dealing with tools for LAN configuration. Last month I dealt with physical layout and connection of network hardware. This time I'll look at some of the diagnostic software that can help prepare PC hardware (IBM and compatible) for network-software installation.

LOCAL AREA NETWORKS

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Scotts Valley, CA 95066
(408)438-8247

Dariana Technology Group, Inc.
7439 La Palma Ave., Ste 278
Buena Park, CA 90620
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Copyright ' 1990 by Wayne A. Yacco. All rights reserved. An editor, writer, and consultant specializing in microcomputers and their business applications, Wayne Yacco writes articles, columns, and reviews for many trade and business publications. He can be reached at Box 269, Burbank, CA 91503

THREE USEFUL PACKAGES

Ashton-Tate's Control Room, Diagsoft's QAPlus, and Dariana's System Sleuth all allow you to examine available hardware resources. They can be used to determine exactly what features—memory, ports, drive types, and other peripherals—are installed in a system.

A system's existing resource assignments may conflict with network hardware, firmware, and software. Therefore an even more important feature of diagnostic programs is their ability to determine which resources are already in use, and by what other processes. Knowing which processes are causing a conflict allows you to try reassigning resources such as interrupts (IRQs) and direct-memory access (DMA) channels that are required by network hardware drivers or the network operating system.

Control Room provides an excellent report of a system's hardware and can list the programs using EMS and XMS memory. In addition to hardware configuration, QAPlus and System Sleuth report interrupt assignments, and internal and installed device drivers.

Both Control Room and QAPlus have features beyond reporting. Control Room can alter an array of system features, such as keyboard and fixed-disk, to improve their performance. It also includes a number of utilities. One that's particularly slick, creates a boot disk that will reload system settings in an AT's CMOS storage after its battery is replaced. QAPlus is well known for its suite of sophisticated hardware tests. It is used by everyone from end-users, for locating defective components, to manufacturers, for quality-assurance testing.

Sleuth reports more intimate detail of the system's hardware and software, including TSRs and a map of interrupt vectors (which can help to resolve software conflicts). It alone discloses an I/O-port map. Once conflicts are detected, I/O ports can usually be changed either through software settings or by configuring DIP switches or jumpers on adapter boards. These ports are register addresses, and hardware vendors frequently provide means for selecting among several choices. The PC can address 65,536 of them.

Other resources are relatively scarce in the PC. A small amount of I/O memory, and a very limited number of interrupt assignment and DMA channels, can be configured to avoid conflicts. In other cases it may be necessary to choose between devices such as a caching disk controller and a fax board.

THE NUTS AND BOLTS OF CONFLICT AVOIDANCE

System Sleuth reports the contents of I/O (input/output) memory space where ROM-based BIOS (basic input/output system), shadow RAM, and EMS pages are often mapped. Usually conflicts can be avoided simply by following recommendations of the network vendor to remove drivers and terminate-and-stay-resident software from a system.

Some processes, however, cannot be conveniently removed. BIOS software for controllers and disk-partitioning software are among the processes which may need to coexist in these areas along with the firmware for a network adapter. Unfortunately not all products fully document their use of resources and, even when they do, documentation is not always readily available.

A system's existing resource assignments may conflict with network hardware, firmware, and software. Diagnostic programs can determine which resources are already in use, and by what other processes.

I/O addresses are located in the 384K located between the upper limit of the PC's real memory (640K) and the beginning of extended memory (1,000K or 1Mb). The addresses may be mapped onto a variety of memory types by hardware vendors. They may point to shadow RAM on some ATs, or they may point to video memory on an adapter or to ROM on a controller of nearly any type. So, part or all of the address space required by a network may be occupied by other I/O software.

There are many possible causes of conflicts. EGA BIOS and extended video memory (used to provide additional colors or resolution) may reside in blocks beginning at hexadecimal addresses A0000 and A8000. The length of these blocks is nominally 7FFF (32K) so they end at A7FFF. However, applications do not always occupy the entire area. Conventional video memory begins next at B0000 and extends to B7FFF. EGA or VGA BIOS may also reside from C0000 to C7FFF. C8000 to CFFFF is the area of an XT's fixed-disk-controller BIOS; on an AT it may hold VGA BIOS. VGA BIOS, for 16-bit controllers, may also occupy the areas from C8000 to CFFFF and from D0000 to D7FFF. The area from E0000 to E7FFF is where ROM BIOS is shadowed on some ATs. F0000 to FFFFF is reserved for BIOS. EMS software and other controllers can also require space in these areas.

Note that you may encounter references to these addresses without the least-significant nibble (four bits). That is, A000 will refer to A0000. This follows the convention of 8086-family segment registers which, in order to address the PC's full megabyte address space with 16 bits, are forced to drop the least-significant hex digit. For this reason, segments always begin on a boundary which is evenly divisible by 16 (hex 10), and memory pages are 16 bytes long. Sixteen-bit registers simply can't address segments more precisely. So, A000 may refer to the segment boundary which corresponds to absolute address A0000.

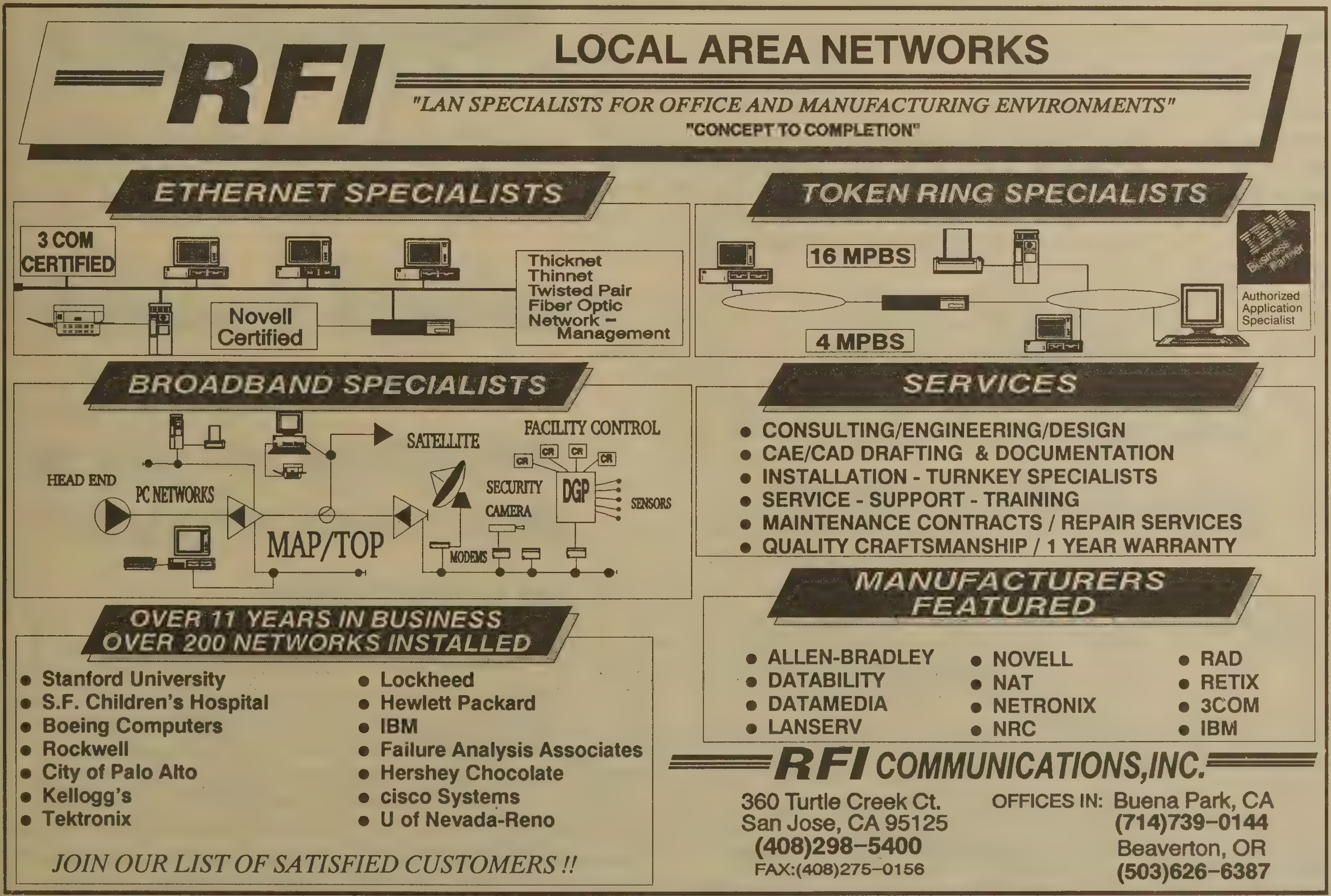
The following are the most common IRQ assignments (interrupt requests or, simply, interrupts). Serial I/O usually uses IRQs 4 and 3 for COM1 and COM2 respectively. The floppy controller uses IRQ 6. An XT's fixed-disk controller uses IRQ 5. A system's first printer port (PRN or LPT1) typically uses IRQ 7 (LPT2 may use IRQ 5). IRQ 2 and 5 are usually available. ATs have an additional set of interrupts available from 8 to 15. Only IRQs 10 and 15 (hex A and F) are usually candidates. IRQs 11 and 12 are reserved for options which have not yet been implemented. They may be available. Other IRQs are reserved for system resources: 0, timer; 1, keyboard; 8, real-time clock; 9, revectored IRQ 2; 13, math coprocessor; 14, hard disk.

DMA channels are not assigned to resources but, with one exception, allocated on request. That exception is channel 0, which is dedicated to refreshing DRAM. At least some of the other three channels will probably be in use by disk controllers. Channel 2 is typically used by the floppy controller. The XT will also use one channel for its fixed disk. An AT has an additional four channels, but because of the way they are implemented, only three more are available. (Channel 4 is used to link—or "cascade"—the two DMA controllers together.)

However, the AT does not use DMA for its fixed disk. Your hardware's installation guide will usually recommend one or two alternatives.

I'll be continuing this discussion of configuration and installation in coming columns with a look at two or three additional types of software: programs that analyze network traffic, those that let you work with remote workstations from a local keyboard, and network utilities. These applications can be used to fine-tune a network and to more easily solve remote problems after workstations are installed. ■

DMA channels are not assigned to resources but, with one exception, allocated on request. That exception is channel 0, which is dedicated to refreshing DRAM.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The Dell 316LT is a superb computer, competitively priced, with all the features you'll want. It's not a notebook computer, but a full-size 15 lb. clamshell-style portable. While I like the notebook computers, I really prefer to work on the larger units.

This type of machine offers virtually desktop-quality performance with the added ability to take the computer on the road. Extremely well designed, this unit offers expandability, connectivity, and flexibility.

In its least expensive configuration, the Dell 316LT comes with 1Mb of RAM and a 20Mb hard disk for $3199. Different configurations are available all the way up to 8Mb of RAM and a 120Mb hard drive. The central processor of this unit—in any configuration—is an 80386SX chip running at either 8 or 16MHz, which means that you can easily set this system up to run Windows, DESQview, or even OS/2. As a matter of fact, Dell offers you a choice of DOS 3.3 ($99.95), DOS 4.01 ($119) or OS/2 ($299).

From the moment I opened up this package, I liked the computer. It has a black case with a convenient carrying handle that also folds under the unit and gives a nice angle to the keyboard. It has a 3.5" disk drive plus a hard disk.

Wisely for a mail-order house, Dell has designed this computer for a person who does not have a salesman around to walk them through the first steps of setting up the computer. A "Getting Started" booklet tells the complete novice how to begin. Next, a tutorial disk takes you step by step through getting things going. This is especially useful for the real beginner, as the information is presented visually. From there you move on to the full documentation, which is well written and conveniently organized.

When you open the computer, you'll see that the inside of the hinging top contains an LCD display with backlighting. It normally displays black text on a white background; I find this color combination the best for portables. The screen provides VGA resolution which gives a wonderfully clear image. In an office setting, it is simple to attach a VGA color monitor to the 316LT. One particularly nice thing about the Dell setup is that you can completely remove the LCD, which lets you get the unused display completely out of the way when you're using a standalone monitor.

Dell shows the same consideration for the worker in the office setting by accommodating a full-size keyboard. Although the keyboard layout and feel on the computer is as good as any I've seen, I still prefer my full-size keyboard with all the bells and whistles. You can use any PS/2 keyboard by attaching it to the port on the back of the computer. This means that you can use this computer with a separate monitor and keyboard and really have an office system with almost no compromise.

Your only limitation is in the installation of cards. Unlike so many other computers, however, this one does accommodate any standard short ST or AT card. This means you can install a network card. Dell sells an EtherCard ($200) and a modem/fax combination card ($399), and you have many other options.

The Dell 386LT offers laptop/desktop power and convenience.

You can use this computer with a separate monitor and keyboard, and have an office system with almost no compromise.

Dell seems to have designed this computer for a user who will frequently use it as an AC box. They recommend that you not use it on batteries any more than necessary because the nickel-cadmium batteries can be recharged only a limited number of times. They supply an AC adapter, which also serves as a battery charger.

I've never seen a charger designed like this one. If your computer is turned off and you plug in the AC unit, the battery will quick charge in two hours. If, however, the computer is being used, the charger will take eight hours to trickle charge the batteries up to a full charge. Two rechargeable battery packs come with the computer; and you can buy

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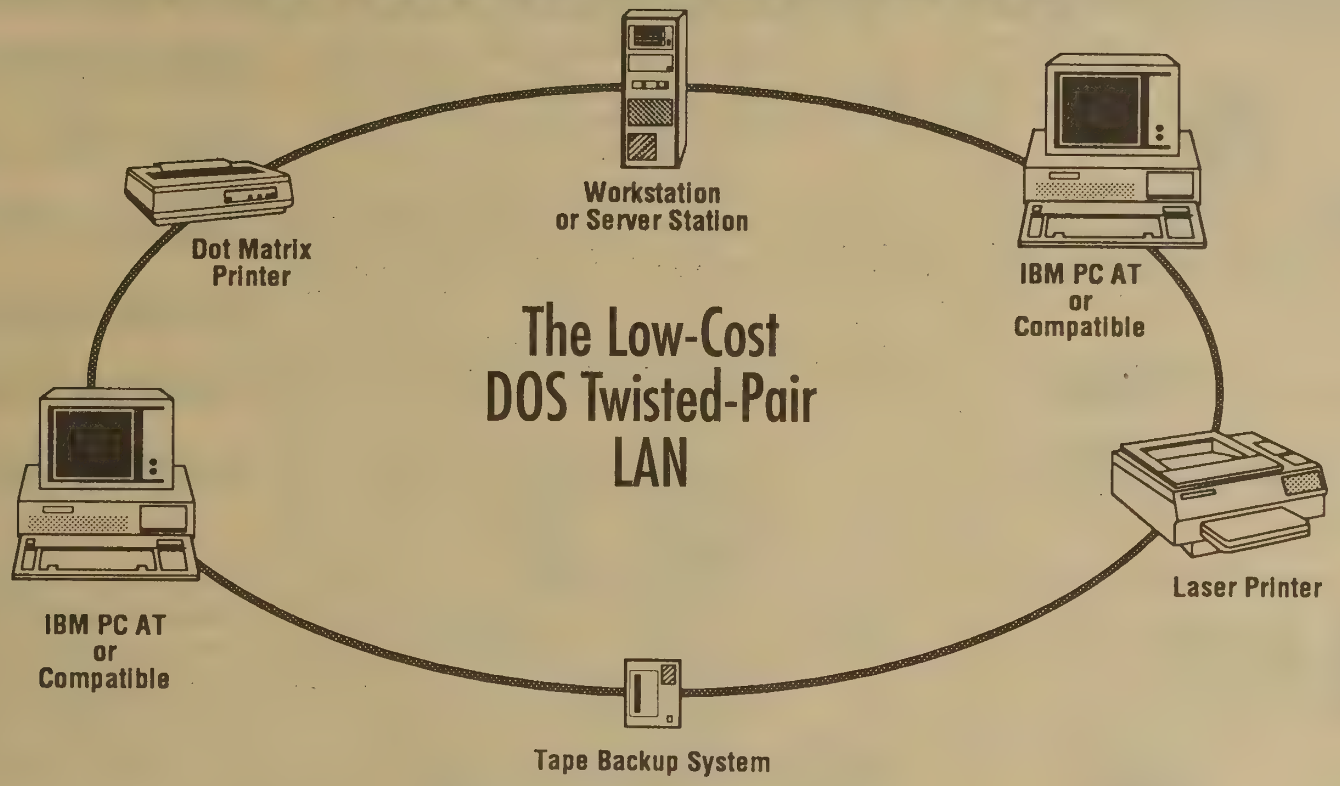

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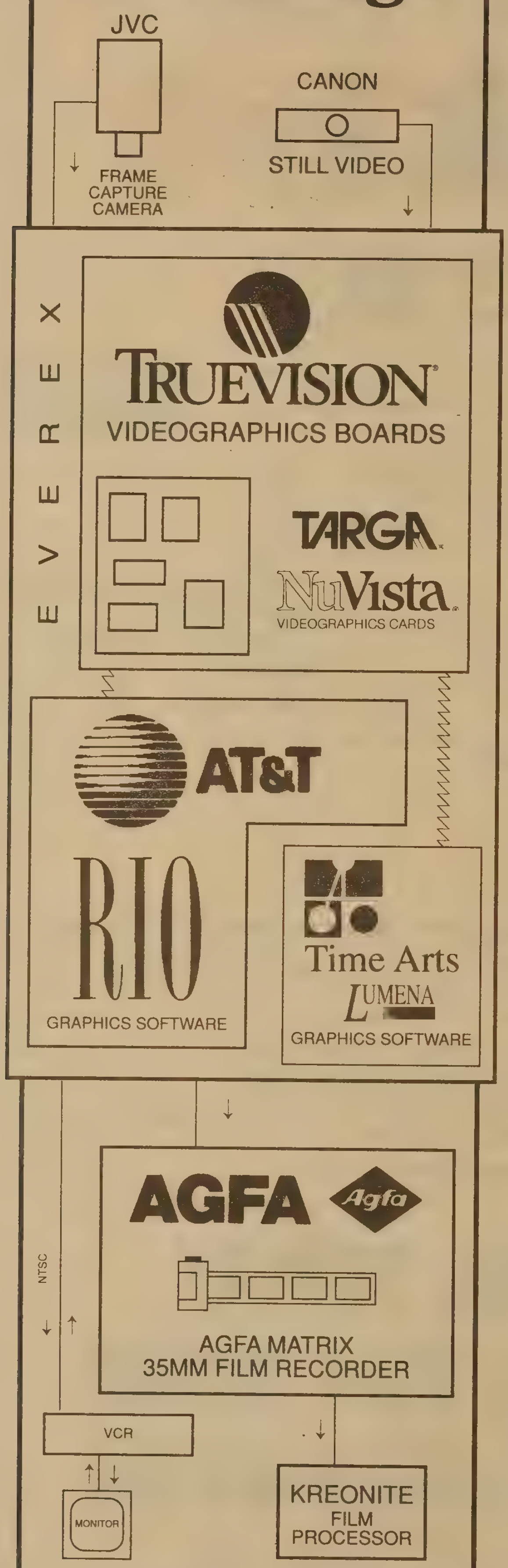

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more should you need them. Dell estimates that they will run the computer for about two hours each.

A particularly nice feature of the 316LT is that when the battery needs to be changed, you don't have to power down and save your files. An internal battery with enough power to run the computer for up to two minutes—more than enough time to change battery packs—takes over.

Dell has packed this computer with energy-saving devices. For instance, a standby switch lets you power down everything except internal memory, which saves most of the power. A touch of the standby button brings the computer back to life and restores you to where you were when you put the unit to sleep. A setup screen allows you to control how long the computer will stay awake when there is no keyboard input. After the predetermined time, the screen, ports and drive will shut down until you call the machine back to action through the touch of a key.

The back of the unit is a cover that protects all of the ports—serial, parallel, monitor, keyboard, expansion, and external drive. Dell has a 1.2Mb 5.25" drive ($349) available. The left side has the battery compartment as well as the power supply port. It also has a reset button; few laptops include this feature.

Dell thought of all the little details to make this a perfect computer. Get it with either a leather ($199) or fabric ($79) carrying case.

Started by a young college student, Dell has made its mark as a mail-order-only supplier of quality computer products. They sell their own products, configured to the specifications of the customer, and backed by their own warranty.

While this is cumbersome and even risky in many mail-order situations, Dell has signed on with Xerox Corporation for nationwide technical support. If you have trouble with one of Dell's products, you can call the local Xerox service center and get immediate help at your location. If you are undecided about Dell products, they are returnable for a full refund within 30 days.

MOVIE MASTER: WORD PROCESSOR FOR SCREENWRITERS

I recently saw a book that presented itself as a user's guide for laptops, and was amused that someone thought they could sell more copies of a book by tying it to the laptop market. In fact, ninety percent of the book applies to any computer user—the distinction simply isn't that strong anymore.

Nevertheless, there are software products especially well suited to laptops. One such category is specialty word processors. For some time, I have been playing with Movie Master ($345), a word processor designed for writing screenplays. This is a niche market, but a good deal larger than one might suspect.

When the battery needs to be changed, you don't have to power down and save your files. An internal battery with enough power to run the computer for up to two minutes takes over.

In the past, writing a screenplay on a computer involved lots of fancy dancing on the part of the writer. Unlike most writing, screenplays have a rigid format that involves changing margins after almost every sentence. With conventional word processors, this meant creating macros to change margins, move you into caps lock and back again, and center characters' names.

Movie Master simplifies that complexity and does everything through menus and function keys. With the use of **shift**, **control**, and **alt** plus a function key, you have forty dedicated functions. Movie Master blends them into a customized way of getting all of the format requirements of screenwriting. This program beats anything I've ever seen for getting the job done. Characters' names are remembered. A spelling checker ($50) helps you correct spelling errors.

But all of these capabilities still don't wipe away the defects of the program. The spelling checker is weak. The documentation is pretty horrible. Printer drivers do not all work, and some printers I would expect to be supported are left out.

The program is so good that anybody who seriously wants to write a screenplay should get it. But on the other hand, if the creators of this program would use this as a starting point, tie up loose ends and get a writer to prepare the documentation, they would have a great product. ■

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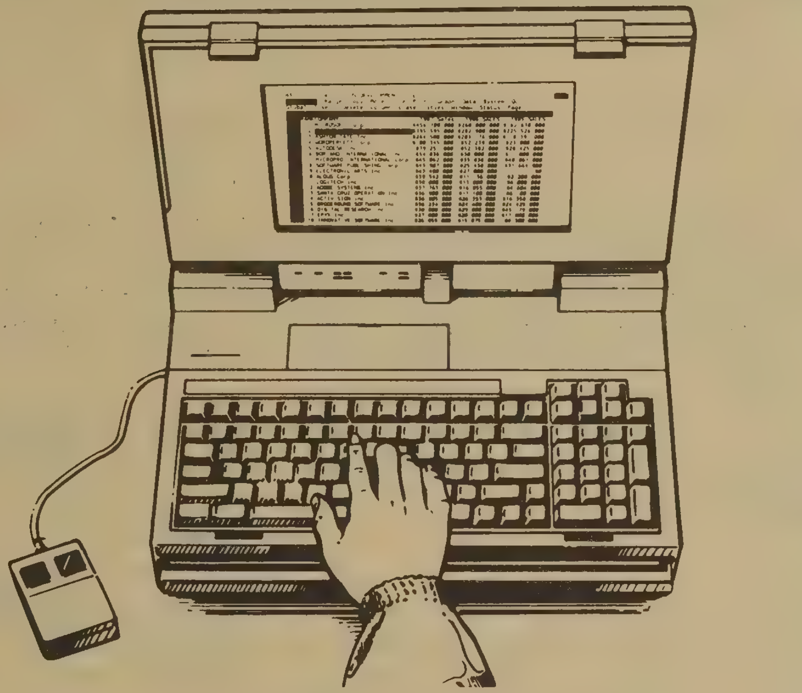

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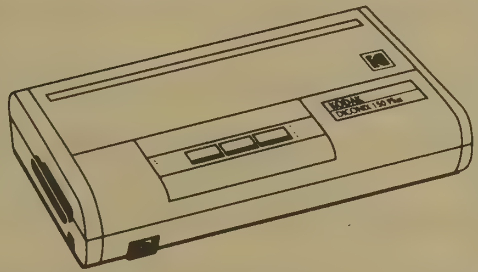

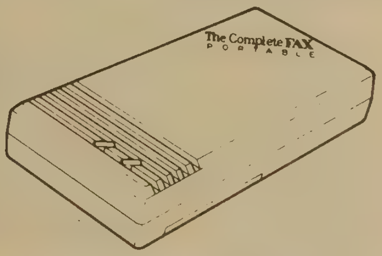

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CREATIVE TOOLS

Hard Disk Horror Stories And How To Avoid Them

BY DAVID MORGENSTERN

BMUG

It's very hard to write while listening to a baseball game on the radio. It's hard to do much of anything, except eat, while keeping an ear out for the count on your favorite batter. It's almost impossible to think clearly about technical Macintosh matters with runners on first and third.

When the San Francisco Giants were losing regularly in the spring, it was better to hit the keyboard than face the bitter music of a defeat. No matter how hard I'd strike the keys, grind my teeth, grumble and moan, nothing could drown out the hangdog murmur of the crowd.

But the Mac is so much fun it wore the edge off my sports-induced depression. A winning baseball team and a Macintosh—that's a combination that puts me in the clouds!

HARD BALL

Why are we so surprised when we have trouble with our hard disk drives? Is it the reassurance of the name, *hard* disk? You'll never see an advertisement for a tough, steel-belted radial all-weather smooth-riding drive. Maybe it's the case that surrounds the drive? It's made out of metal, and the cat can't scratch it, so it must be sturdy.

We act as if our files are something more than invisible patterns of magnetism hidden in layers of ceramic and metal. Perhaps it's because we use familiar words—"read" and "write"—that have real-world non-virtual counterparts, that we feel our data is indestructible. Intellectually we know that the hard disk is a fragile electronic machine, but emotionally we believe that the hard disk *writes* the data on the platter, like a typewriter smashes ink into a sheet of paper.

The high-resolution Macintosh screen and clear graphics support this superstitious conditioning. When we're done reading a page, we can throw it away in the trashcan. The symbol and the reality have become blurred in fuzzy illogical thought. We're uncomfortable with the thought that we've built the foundation of our data home on eggshells. No wonder that this technology was invented in California, where we keep building houses on the sides of hills in earthquake and landslide country.

A user in data denial is a terrible sight, especially among experienced technical types that are supposed to know better. I was talking about backups with Steve Costa, BMUG's resident technical resource, as he tried to recover a poor programmer's weeks' worth of double- and triple-overtime programming. It's hard to be brave and put on a good face at eleven at night after a BMUG meeting, facing a dead 100Mb drive. Experience is our name for accumulated errors—human and computer.

Here are some random bits on hard disks and living with them:

- In 1986, Reese Jones, one of the founders of BMUG and now boss of Farallon Computing, said that anyone that needed a hard disk larger than 20Mb was a software pirate. This was nonsense then and now, but it lead me to formulate Morgenstern's First Law of Hard Disks: *The optimum drive size doubles every two years.* The best size for a hard disk in 1986 would have been about 40Mb. The optimum size today is around 170Mb!

A small drive may be just right for a user when starting out, but turns into a cramped attic a year later. Larger drives are more expensive, and have the room to accommodate the future demands of developers and users.

In 1986 most Mac users only dreamed of getting a hard disk (or

Morgenstern's First Law of Hard Disks: The optimum drive size doubles every two years. The best size for a hard disk in 1986 would have been about 40Mb. The optimum size today is around 170Mb!

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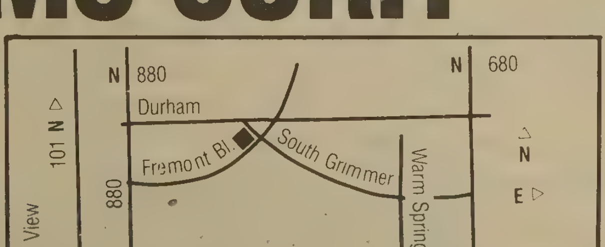

Not responsible for typographic errors

additional memory), and publishers wrote programs that didn't require extras. But soon many programs, and even Apple-provided "system software," like HyperCard, required a megabyte of memory and a hard disk drive. Memory-hungry graphic and multimedia applications, with their huge document children, are moving into the neighborhood. Programs like PhotoShop already require plenty of desktop real estate for their files (scanned images are often two or more megabytes), and use virtual memory just to hold documents and changes while the program is operating. Users want to be able to manipulate their data *and* undo those changes.

System 7.0's built-in virtual memory (for 68030 Macs or equivalents) will help developers push current memory barriers aside. Virtual memory needs contiguous disk space, something hard to find on well-filled 80Mb drives. It won't be impossible, but you may have to do some trimming and optimizing to get the needed space.

> **Intellectually we know that the hard disk is a fragile electronic machine, but emotionally we believe that the hard disk writes the data on the platter, like a typewriter smashes ink into a sheet of paper.**

• The demand for the high capacity drives has brought out the worst in some drive manufacturers and vendors. Most drive suppliers buy the actual drive mechanisms from a few manufacturers, and then add-on power supplies, cases, controllers and fans. I recently spoke to a hardware engineer who puts prototype drives through their paces. He spilled the beans over pizza and beer—the correct combination to open a hacker's heart.

A major drive manufacturer had developed a new drive that used a special memory cache to speed things up. The cache hardware and software combination had not been fully tested and implemented, but the company shipped over one thousand pre-release drives to a discounter. The Mac IIci and fx models would have trouble with these drives, but the bozos assumed that most would be sold to owners of less problematic flavors of Macintosh. They hoped that by the time angry users fought their way though the customer service maze to get a drive that functioned properly, the bugs would have been worked out. The only losers would be the users who unknowingly enrolled in a drive-testing program with a simple purchase. It's the nasty old computer industry practice of "get it out the door and we'll fix what complains."

The engineer related how he'd been on the phone yelling at a manufacturer about the poor quality of the 200Mb drives he'd just received. Over 60% of the drives had problems. The vendor assured the engineer that their product had a much better record than that—only a 14% failure rate! This insanely high figure was supposed to make our hero feel better about the product. A 14% failure rate is a quick ride to hard disk bankruptcy court.

HOT TIP:

If you use old floppies for backup, always reinitialize them first, which can help cull out some of the duds. Don't just select all your old files and drag them to the trash.

• Most computer users do not back up their data—ever. I asked the power elite around the BMUG office, and found that only one person backs his work up, and only because his office had a tape backup. Their complaint was that high capacity drives are too much trouble to back up.

Users are living on the slim faith that they will be able to recover their work using disk recovery programs. This is playing computer Russian roulette with your data. A "recovered" disk is a nightmare, where all your files become unnamed puzzle pieces. Every file must be opened to see what's what, and what's left.

I use the three-cornered hat strategy: archive, data, and paranoia.

The **archive** is the foundation of a backup. It contains everything on your drive, applications, utilities, and your System folder. It is a recreation of your personalized computer world. The archive is a like beached whale, hard to move and hard to avoid. Budget a couple of days to restore everything from master floppies in the Finder, if you have *not* used a backup program to quickly recover from disaster.

Unfortunately it takes a drawer full of floppy disks to back up a drive, even with the compression routines that some programs use. When I restored my 40Mb drive recently, I found that some of the old floppies I'd used for the backup were no good—my data didn't appreciate this. This discovery is always made *after* the fact, when you're trying to put everything back. If you use old floppies, always reinitialize them first, which can help cull out some of the duds. Don't just select all your old files and drag them to the trash.

What's needed for archive backups is a medium that is reliable, holds lots of data, and won't break the bank. The dinosaur of storage, the tape drive, seems to fit the bill. Drives using the TEAC 45S2 mechanism are not horribly expensive, and are reliable. The cas-

WHAT IS BMUG?

BMUG is an educational non-profit consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide.

Like any growing organization, it is many different things to its 10,000-member international membership. BMUG supports many Special Interest Groups (SIGs), an eight-line Bulletin Board System (BBS), free HelpLine, software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 400+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:00 to 9:00 (or whenever we finish), in the Physical Sciences Lecture Hall on the UC campus. BMUG West is a meeting held monthly in the Exploratorium, San Francisco's science museum.

The BMUG HelpLine, (415)849-HELP, and our fax number, (415)849-9026, provide technical assistance and telephonic hand-holding during business hours (11 am - 5:30 pm). If your question can't be answered on the spot, we try get you in touch with someone that can help. Of course, not every problem can have a happy ending—but we try.

BMUG has one of the most up-to-date, comprehensive software libraries around with 400+ double-sided disks filled with the latest versions of public domain or shareware programs and HyperCard stacks. New disks are unveiled almost every week at the Thursday general meeting. BMUG also brings you the *PD ROM™ 2.0*, our entire library and more on CD-ROM—according to Apple, it's the best selling CD-ROM!

Our BBS offers many of the latest versions of files in our software library as well as news, private mail, rumors, etc. The BMUG BBS is part of the worldwide EchoMac Network on FIDOnet (161/444); by calling a local FIDOnet BBS in your area, you would then be able to get in touch with us wherever you are, as well as send mail to users everywhere! BMUG is now a part of the international USENET network (apple!bmug!user.name@sun.com) or (user.name@BMUG.FIDONET.ORG). With our multi-line capability you now have access to BMUG almost 24 hours a day. It's easy to use, fun, and a great resource.

To get some further information about BMUG please write to: BMUG, 1442A Walnut St. #62, Berkeley, CA 94709. If you prefer to phone our business office, call (415)549-BMUG, or Fax (415) 849-9026.

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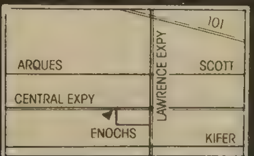

settes hold 80Mbeach.

Every time tape drives are mentioned at BMUG, an argument breaks out. Unlike other more advanced (and expensive) technologies, tape can only be used for backups. A tape drive cannot be mounted on the desktop and used in the same manner as a read-write optical drive, or as a removable hard disk media drive might. This is really a feature, since tape drives are like waffle irons—they're only used once in a while, and will last forever.

Personal data files with information that might cost you money (credit card numbers, passwords, bank account numbers) should be stored on floppy disks, not on your hard drive. A local corporate information broker bought a dead drive at an outdoor flea market, recovered the drive, and found all kinds of goodies. If you sell a drive, be sure to reformat it first.

Even better, some smart Macintosh stores are renting out tape drives. MACadam Computers in San Francisco rents out the drives overnight, and lets users come into the store for an emergency restoration.

The **data** on your disks is your most precious computer artifact. It is much more valuable than your hardware or your software—it is utterly irreplaceable. Most data used on a day-to-day basis can be easily backed up onto floppies. This includes large PageMaker, Excel, and database files.

The backup will be easier if large files can be broken down into smaller files. If you're working on a book, keep everything in units as small as you can; then only the parts actually needing backing up will be written. Many backup utilities can be set to only back up data files that have been altered since the last backup.

I'm **paranoid** about loss of data. I expect an earthquake to hit while I'm writing this column. I expect the cat to jump on the hard disk, sending all my data into oblivion. That's why I **Save As** to a floppy every once in a while. It protects me from having to grind my teeth down to the pulp, which I would do if I had to recreate from memory what I had written.

Thanks to my genius dentist, Dr. Dave, and my data preservation plan, my teeth are safe—or safer. Pass the French bread!

HOT TIP:
If you have someone else recover your data, make sure they trash the recovered files when they're done. This is the practice at the BMUG office, and should be industry-wide.

- Here's a hard disk recovery horror story, and tip from a BMUG member who makes his living writing one-of-a-kind database applications. He bought a 300Mb drive from a small hole-in-the-garage company down in the Silicon Valley. The drive went dead, and the makers had him mail the drive to their shop, where they'd recover the data and fix the disk. Customer service, right?

A month later, the drive went haywire again, and our buddy drove south to deliver the mechanism in the flesh. He also wanted to check out the operation, which is difficult to do on the telephone. His drive was hooked up to a 600Mb drive, and the files were recovered. As the technician moved around the desktop of the jumbo drive, looking for the folder of recovered files, our hero saw that this drive seemed to contain a copy of every Macintosh program in existence.

Suddenly he saw an unusual icon, and asked the tech about it. He replied, "I dunno, some program, I guess." Our hero informed the sap that this was a program he had written, and that only he and his customer had copies. Yet here it was, sitting with hundreds of friends on this vendor's drive.

It turned out that after recovering people's drives, the workers would prowl through the volumes stealing anything they hadn't already ripped-off from other poor users. He also found his copy of Mathematica, as well as the proprietary contract programs he had written.

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Who would have thought that living with hard disks could be so complicated? I turn on my Mac and say a small prayer for my data's health and security. Will I get a smiling face, or a blinking question mark? A drive that lives, or dies? I've been thinking positive thoughts at it recently, just in case...

A CUTE LITTLE BYTE

Macintosh programs used to be littered with little notes from the programmers to the users. Some were pictures, others were obscene, while many were just names. Apple has been removing the obvious ones, but some sneak through the censors. They are activated by hitting certain key combinations in certain windows, etc.

To see one of these "gifts," open the System 6.05 Installer program (version 3.0.1). The first window is the Welcome sign, which will not do the trick, so continue on to the Easy Install window. Type the word "ski" and you'll see the treat from the programming team. They describe themselves as "the aunt of the world's most adorable niece, a cliff-jumping, tree-bashing extreme skier, a reptilian artist collector, a dizzy bit of goat cheese, a pilot, Alan's dad, Blair's dad, and one righteous dude." They give you a choice of busy cursors to use in the program. Very cute, dudes.

SHAREWARE SPOTLIGHT

I've gone absolutely nuts for games this year. I never used to be so interested in them, but now I stay up all night ruining my health and my wrist playing them. I currently like a shareware game called Glypha, a version of the commercial arcade game Joust. You control a rider on a giant ostrich-like bird inside an Egyptian tomb. Evil sphinxes appear and attempt to run you through with their swords.

The graphics are excellent. The game is in black and white, but has a setting to slow the game down for a Mac II. Glypha doesn't like MultiFinder, and isn't very happy when it returns from a screen saver.

If you're killed by a sphinx, you're turned instantly into a pile of bones. I keep getting zapped by the pools of lava and the eye that appears at the wrong times. No one can say that Glypha sphinx is not a party animal! ■

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40MB (28MS)	1179	1529	1629
65MB (25MS)	1329	1679	1779
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Enhanced 101 Keyboard
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Monitor, Display Card extra

$549

OPTIONS : Video & Hard Drive

VIDEO DRIVE	MONO12" 720X350	VGA14" 640X480	SYNC14" 800X600
20MB (65MS)	849	1199	1299
40MB (28MS)	949	1299	1399
65MB (25MS)	1099	1449	1549

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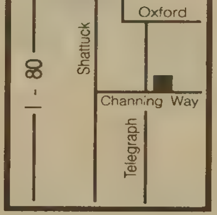

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The Open Mailbag

BY MATTHEW LEEDS

The last few months I've been busy covering new Commodore hardware. As a result, the pile of software awaiting review has gotten out of hand. This month I'll get caught up.

TV*SHOW

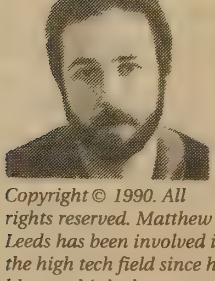
TV*Show from the Zuma Group has been updated to Version 2. This new version adds support for the ANIM format and 8SVX sound files. There is also support for most any IFF image, including HAM, EHB, and overscan. The manual is now much larger, and is spiral bound for easy reference. TV*Show is the companion product to TV*Text Professional.

AMIGA

THE ART DEPARTMENT

ASDG has shipped The Art Department, a new full-featured, 8- and 24-bit image processing software system. In addition to its long list of special effects, The Art Department can create magazine-quality color separations from virtually any image data source with up to 24 bitplanes (16,777,216 colors). Also useful for color desktop publishing and layout, The Art Department produces 12- and 24-bit color separations compatible with ASDG's ReSEP and Gold Disk's Professional Page desktop publishing software.

The Art Department is also of special interest to graphic and video artists who use Amiga 3D modeling software, since it converts 24-bit images to Amiga-displayable images faster than otherwise possible with any of the 3D rendering packages currently on the market.



Copyright © 1990. All rights reserved. Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics, and related fields.

The Art Department uses a modular file loading interface and comes with two file loading modules: a DigiView 21-bit loader and a Super-IFF loader, supporting any IFF format image with up to 24 bitplanes. Formats supported by the Super-IFF loader include: EHB, HAM, AHAM, SHAM, Dynamic HAM, ARES, and Dynamic HIRES file formats. In addition to those file formats currently available, ASDG plans to release loaders for other formats.

The Art Department also gives you extremely powerful palette control, including palette editing, lock in, and the ability to load and save palette combinations. Powerful color map controls are also provided, along with brightness, contrast, and fully variable Gamma correction. The size of images is limited only by your system's memory.

Other features include 208 Amiga rendering/video modes, six methods of dithering, an automated image "touch-up" mode, and a unique facility that uses proprietary edge-detection technology to create line art from any image.

TEMPLICITY

The Sterling Connection has released Templicity, a set of 104 spreadsheet templates for business and personal needs. These templates cover personal finance, home office, real estate, advertising, sales, inventory, taxes, budgets, and other categories of interest to small business. Versions of Templicity are available for Analyze!, MaxiPlan, Superplan, and VIP Professional.

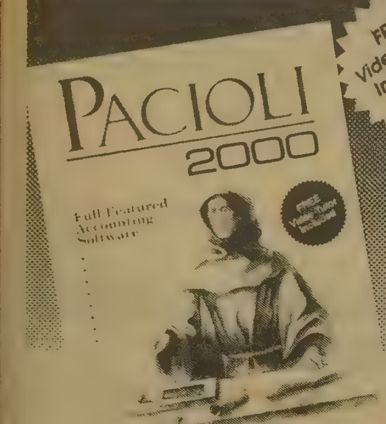
BGRAPHICS

Brown Wagh has shipped BGraphics, a professional business graphics package, designed to generate charts, graphs, and diagrams for screen or printer output. Numeric information can be input directly or imported from spreadsheets. Over 20 different types of charts are provided, with 2D and 3D perspectives. There is full support for IFF graphics, including the use of brushes as columns. BGraphics is quick, easy to use, and produces good-looking results.

DISTANT SUNS

Virtual Reality Laboratories has released Distant Suns, an upgraded and improved version of Galileo, the planetarium simulation. Distant Suns includes a database of over 2,200 stars, with optional data disks that include 20,000 stars from the NASA Sky catalog or 9,100 stars from the Yale Bright Star cata-

The Outline Fonts package provides you with the capability to create professional-looking fonts in any size for use with any Amiga program. This is akin to buying the cow instead of the milk, always a good idea.



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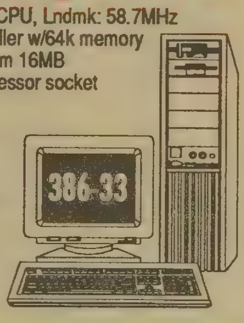

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Basic System -	1,845	2,295	2,390	2,545
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80MB, 19ms - IDE	2,330	2,820	2,915	3,070
100MB, 19ms - IDE	2,445	2,895	2,990	3,145
158MB, 14ms - ESDI	2,965	3,415	3,510	3,665
338MB, 14ms - ESDI	3,410	3,855	3,950	4,105

*Maxtor Drive *Relisys Monitor

MICRO-L 386-25 Business System $1,050

- 80386-25MHz CPU, Lndmk: 28.0MHz
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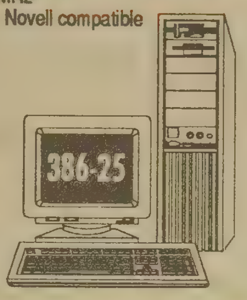
- 1:1 interleave controller or IDE
- AMI BIOS, NEAT™ Chipset
- 8 expansion slots
- 2 serial, 1 parallel, 1 game port
- Keytronics 101keyboard (USA)
- 5-drive AT case with security lock, LED indicators
- 230W power supply
- Tower Case add $85



STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 640 x 480	14" Multiscan 800 x 600	HiRes VGA 1024 x 768 Seiko CM-1440
Basic System -	1,050	1,495	1,590	1,745
WITH HARD DRIVE				
40MB, 27ms - IDE	1,370	1,820	1,915	2,070
80MB, 19ms - IDE	1,575	2,020	2,115	2,270
100MB, 19ms - IDE	1,645	2,095	2,190	2,345
158MB, 14ms- ESDI	2,165	2,615	2,710	2,865

*Maxtor Drive *Relisys Monitor

MICRO-L 486-25 Cache Network Server $3295

- Intel 80486-25MHz CPU, Lndmk: 114.10 MHz
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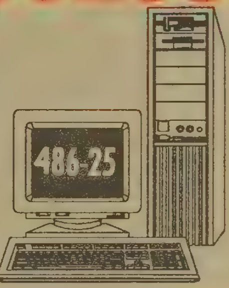
- 1:1 interleave controller
- Keytronic 101 keyboard (USA)
- Tower case w/250W P/S



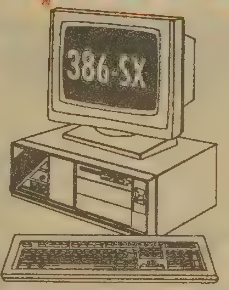
STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA 640 x 480	14" Multiscan 800 x 600	15" Super Multiscan
Base System	3,295	3,735	3,835	4,065
WITH HARD DRIVE				
158MB, 14ms - ESDI	4,245	4,685	4,785	5,015
338MB, 16ms - ESDI	5,745	6,185	6,285	6,505
768MB, 16ms - ESDI	7,845	8,285	8,385	8,605

* Maxtor drive. * Relisys monitor.

MICRO-L 386-SX Executive System $695

- 80386/SX-16 CPU runs 16MHz
- 80387 co-processor socket
- 1MB RAM expandable to 8MB
- 1.2 MB floppy drive (Teac)
- True OS/2, XENIX, MS DOS, and Novell compatible
- AMI BIOS, NEAT™ Chipset
- 1:1 interleave HD/FD IDE cntrlr
- 8 expansion slots
- 2 serial, 1 parallel, 1 game port
- Keytronics 101 keybd (USA)
- Deluxe baby-AT case w/200W P/S

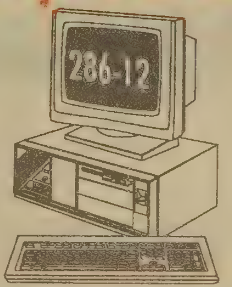


STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor	14" VGA Mono	14" VGA 640 x 480	14" Multiscan 800 x 600
Basic System -	695	930	1,135	1,240
WITH HARD DRIVE				
40MB, 27ms - IDE	1,020	1,255	1,460	1,555
80MB, 19ms - IDE	1,220	1,455	1,660	1,755
100MB, 19ms - IDE	1,295	1,530	1,735	1,830

MICRO-L 286-12 Desktop System $495

- 80286-12.5MHz CPU
- 80287 co-processor socket
- 1MB RAM expandable to 4MB
- True OS/2, XENIX, MS DOS, and Novell compatible
- 1.2 MB floppy drive (Teac)
- AMI BIOS, VLSI
- 1:1 interleave HD/FD IDE cntrlr
- 8 expansion slots
- 2 serial, 1 parallel, 1 game port
- 101 Enhanced keyboard
- Deluxe baby-AT case with 200W power supply



STANDARD SYSTEM W/MONITOR & VIDEO CARD

Monitor & Video Card	No Video & Monitor Included	12" Flat Mono 720 x 350	14" VGA 640 x 480 Relysis	14" VGA Multiscan Relysis
Basic System -	495	595	935	1,035
WITH HARD DRIVE				
20/MB, MFM	695	795	1,035	1,135
40MB, 27ms - IDE	825	925	1,165	1,265
80MB, 19ms - IDE	1,025	1,125	1,365	1,465

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EISA 486-25 w/64K CACHE /CPU	$2395	PANASONIC KX-P1180 9-pin	$158	MAXTOR XT-1085 71MB	$545	RELYSIS VGA RE-9513	$324	TEAC 1.2/1.44 MB FD	$69/$69
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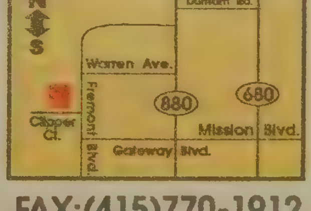

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log. A digitized images disk of over 200 deep sky objects is also available. If you have even the slightest interest in astronomy, space, or the constellations, you owe it to yourself to buy a copy of Distant Suns. It's far more than just an educational program, it's fun to use.

OUTLINE FONTS

Gold Disk has shipped Outline Fonts, a set of 35 Compugraphic fonts and utilities for creating Amiga bitmapped, Professional Draw outline, and PostScript downloadable versions. The 35 fonts correspond to the fonts found in most PostScript compatible printers. The Outline Fonts package provides you with the capability to create professional-looking fonts in any size for use with any Amiga program. This is akin to buying the cow instead of the milk, always a good idea.

JUMPDISK

Disk-based magazines come, and disk-based magazines go, but one disk magazine for the Amiga remains. Jumpdisk has been providing subscribers with quality programs, news, tutorials, music, art, and an ever-evolving level of sophistication for four years. That's longer than many paper-based publications have been serving the Amiga community.

The July issue is an excellent example. It contains a variety of music, art, and tutorials for graphic artists, an ongoing AREXX tutorial, programs for creating your own instruments and improving the Amiga's speech, news and editorial commentary, and an excellent freely distributable virus fighter that works on the A3000.

In fact, ZeroVirusIII is so good that it receives this month's PD program of the month award. It checks your machine for resident viruses, checks each disk as you insert it, checks files and directories for file-linking viruses (like the IRQ virus), lets you archive boot blocks, repairs disks and files infected by viruses, can learn to recognize new viruses, and can be iconified to a small window on the Workbench where it runs in background. ■

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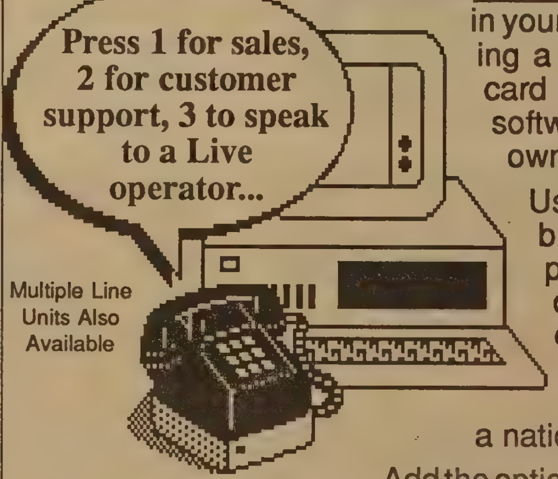
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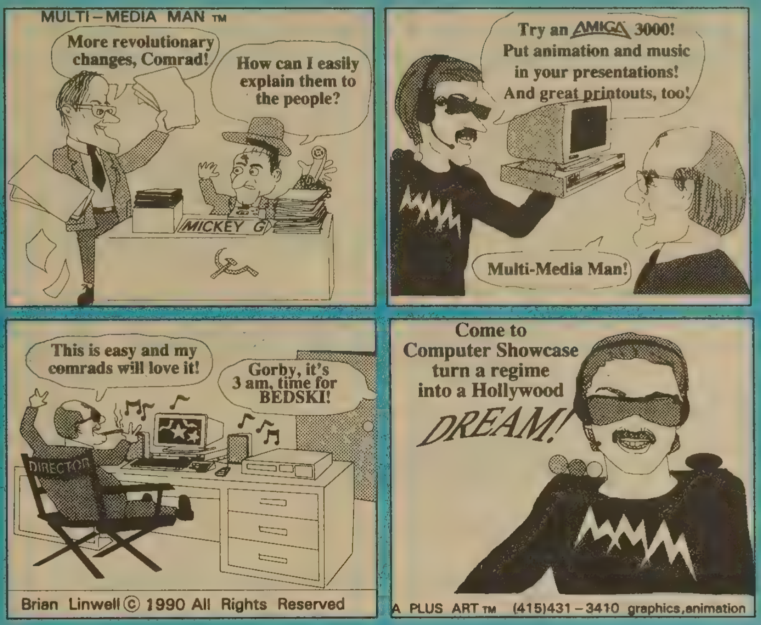
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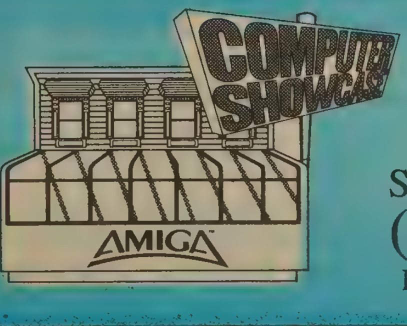

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Grassroots Action

Irate Dealer Starts Open Letter Campaign

BY DAVID HAWKINS

ATARI ST

Bill Yerger of Microworld in Berkeley is an Atari dealer who thinks the ST is not doing as well as it ought to in the US market. He's got a few ideas of his own about what should be done about it and has started a letter-writing campaign to Atari president Sam Tramiel. This is the letter that's being distributed—feel free to type it in and send a copy to Atari, or write one of your own!

THE LETTER

To: Sam Tramiel
President
Atari (US) Corporation
1196 Borregas Avenue
Sunnyvale, CA 94086
Dear Sam,

Atari is not doing very well in the United States. In my opinion, this is a direct result of the marketing program implemented by Atari. I would like to see this change.

Bill Yerger is an Atari businessman who is well aware of the economic factors involved in marketing a mass appeal computer such as the ST and TT. He won't break your bank to get the word out. The Atari ST and TT computers are efficient, capable, and easy to use. If they are presented to the American public in the right manner they would be very popular computers.

Users, dealers, developers, stockholders, and Atari executives and employees would all like to be proud of our computer of choice. We don't want to be "also-rans." I am also sure that you would not mind putting more money than usual in your bank account.

The best way to do this is to popularize the ST/TT operating system, so we can have more development, more dealers, and more users. I believe that the key is to advertise in the right places at the right time with the right ads. Give Bill a chance to put Atari in the media and on the map. If he can regain dealers, developers, and users, Atari can be a force in the marketplace once again. I know it seems too expensive, but: "Good advertising doesn't cost....it pays."

Right now there is no better all-around computer product on the American market than the ST/TT. However, the media does not even mention Atari as a serious alternative, and most Fortune 500 companies do not even know of its capabilities. Bill Yerger might be able to change that, and I would like to see you give him a chance to try.

If you would like to turn Atari's fortunes around, concentrate on making better computers and hire Bill Yerger to manage your marketing.

Thank you,
[your name, address, and phone number here]

MY THOUGHTS

Well, the Atari could use some promotion. During the time I've been writing this column, I've picked up a lot more useful information from Atari dealers than I have from Atari Corporation. The ST has been almost invisible to the public. Even at work, people are more likely to toss an Amiga program on my desk for review than pass along an ST program. Eighty percent of my mail is about DOS programs. In comparison there just isn't anyone out there really pushing Atari goods.

So maybe it is time to write a few letters....

MORE ON THE PORTFOLIO

I heard that you can run MKS Toolkit on the Atari Portfolio. The Portfolio is Atari's DOS compatible computer that's about the size of a VCR tape. The MKS Toolkit adds the power of most of the UNIX utilities, so you can run UNIX shell scripts. UNIX is a fairly flexible way of putting in small specialized programs and having them work together to perform complex tasks.

THE TT

The TT computer mentioned in the open letter is supposed to be a 68030-based Atari computer. It runs at 32MHz, and has an option for a 68882. The TT has 2Mb of RAM, which can be extended. It also has more ports than the ST does. I haven't seen one yet, but hope to review one soon. ■

During the time I've been writing this column, I've picked up a lot more useful information from Atari dealers than I have from Atari Corporation. The ST has been almost invisible to the public.

Copyright© 1990 by David Hawkins. All rights reserved. *David Hawkins is the host of the Atari conference on The WELL (415/332-6106); send email to dhawk. He has one of the first Atari ST 1040s sold in San Francisco. Both monitors, an Okimate 20 color printer, and disks are all over the room.*

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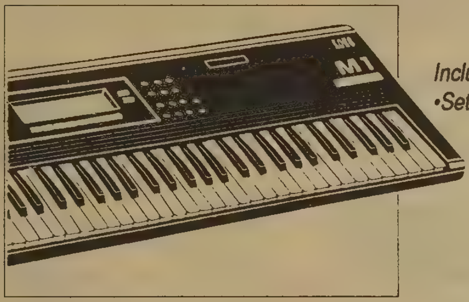

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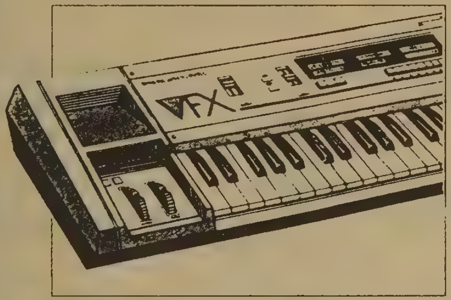

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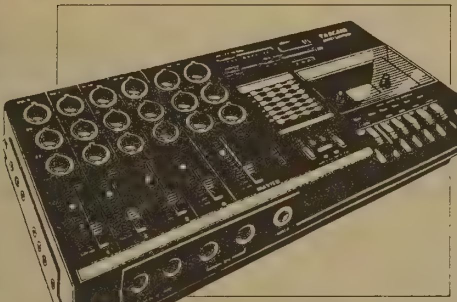

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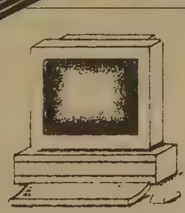

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August 11 Computer Mart. Cupertino. De Anza College. Call: (408)864-8350.

August 11 Computer Show & Sale. Marin. East-West Computer Shows. Call: (415)388-8893.

August 11 WordPerfect 5.0/5.1 Session 1 Course. San Francisco. Training Works. Call: (415)243-0100.

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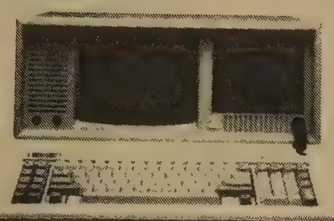

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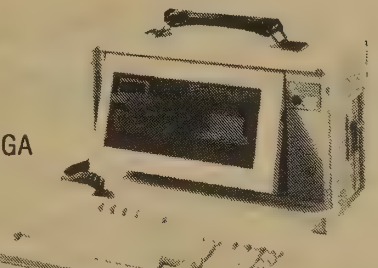

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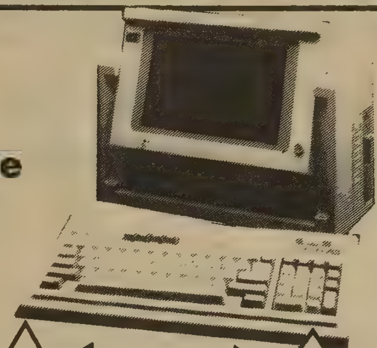

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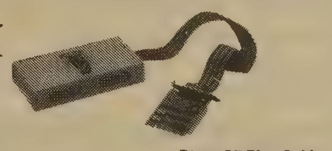

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Includes: AT Case, KB 101, 230W P/S, 1MB RAM, 1.2MB FD, HD/FDC, AT I/O.

ADD-ON CARDS

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Monochrome Graphics Printer Card	$30
Everex EGA EV-659 (Micro Enhancer)	$105
Everex EGA EV-659a w/o printer port	$95
Genoa Super VGA-16 (6300/6400)	$140/165
Genoa Super EGA (800x600)	$75
576KB RAM Card for XT (OK) KW-513	$35
384K Multifunction I/O (MF-100 DFI)	$75
2MB Memory Expansion (Memo-2000XT)	$79
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Multi I/O XT (S/P/G/CLK/FDC)	$45
I/O Plus II Card/ XT (S/P/G/C)	$45
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Everex 2400 (Ext.)	$185
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Everex 1200	$69
Telemidas 2400	$95
Telemidas 1200	$55
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Seagate ST-138 Hard Disk (30 MB, 28ms)	$285
Seagate ST-225 Hard Disk (20 MB, 65ms)	$195
Seagate ST-238 Hard Disk (30 MB, 65ms)	$215
Seagate ST-251-1 Hard Disk (40 MB, 28ms)	$295
Seagate ST-4096 Hard Disk (80MB, 28ms)	$550
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DTC-5160 Hard Disk Controller/XT (RLL)	$60
DTC-5280 HD/FDC Controller AT	$89
DTC-5287 HD/FDC Controller AT (RLL)	$95
DTC 7287 HD/FDC Controller 1-1	$115
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Conner Hard Disks	CALL

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Star Printer NX-1000 Rainbow Color	$225
Epson Printer LX-810 (9-Pins, 180CPS)	$189
Epson Printer FX-850 (9-Pins)	$345
Epson Printer FX-1050 (9-Pins) wide	$455
Epson Printer LQ-510 (24-Pins)	$325
Epson Printer LQ-850 (24-Pins, 264CPS)	$535
Epson Printer LQ-1050 (24-Pins, 264CPS)	$675
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KXP 1180 (9 pin, 192 cps)	$185
KXP 1191 (9 pin, 240 cps)	$225
KXP 1124 (24 pin, 192 cps)	$325
KXP 1624 (24 pin, 192 cps)	$399

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Logitech Hi-Res Bus Mouse C9	$79
Logitech Hi-Res Serial Mouse C9	$75
Logitech Paint Show	$10
LogiCADD	$29
PC Optical Mouse (with Dr. Halo)	$85
DFI HS-3000 Scanner	$175
Scanman Plus	$175
A4 Scanner/OCR	$225
A4 Color Scanner	$595
Logitech Trackman Serial	$85
Logitech Trackman Bus	$95

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Voltron 14" Flat Screen	$95
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Nanao VGA 9070S	$950
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Relisys 14" EGA Monitor	$345
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Quimax VGA 14" paper white	$135

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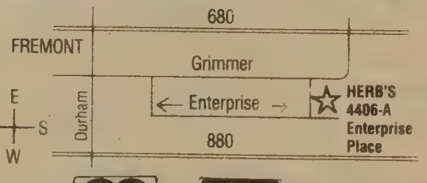

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Calendar Of Events *continued*

August 21–24 Hands-on Datacomm Troubleshooting Course. San Francisco. Integrated Computer Systems. Call: John Valenti. 1-800-421-8166.

August 21–24 Software Project Management Tools & Techniques Course. San Francisco. Integrated Computer Systems. Call: 1-800-421-8166.

August 22 PageMaker Part I Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 10

From Psychedelics To Cyberspace

The Palace Of Fine Arts
San Francisco

The Learning Annex is presenting Dr. Timothy Leary and Eric Gullichsen in a special program entitled *From Psychedelics To Cyberspace*, August 10 at the Palace of Fine Arts in San Francisco. Dr. Leary will discuss his work as well as join Eric Gullichsen, Sense8 Corp. founder, in a demonstration of Cyberspace. The demonstrations will be done on large screens and volunteers from the audience will be asked to step into this computer generated three dimensional world. For more information, contact: Katharine Harts, The Learning Annex, (415)922-9900.

August 22 Automating Your Business Accounting System On A Macintosh Seminar. San Francisco. J.C. Lukrich & Co. Call: Suzette, (415)864-6770.

August 22–24 NetWare 286 System Manager 501 Course. San Francisco. SERVTEL. Call: (415)764-1400.

August 22–24 First Annual Macintosh Summit Conference. Santa Barbara. U.C. Extension, Call: (805)961-4143.

August 23 Lotus Seminar. Santa Clara. 800–Software. Call: Lisa, (415)421-7013.

August 23 PageMaker Part II Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 23–24 UNIX System Programming Class. San Jose. Arix and Berkeley Decision/Systems. Call: (408)458-9708.

August 24 Computer Network Education Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

August 25 Intro To Graphics Course. San Francisco. Computer Alliance. Call: (415)771-1671.

August 25 Computer Swap. San Francisco. Computer Swap. Call: 1-800-433-7469.

August 25 IBM PC Clone Troubleshooting And Repair Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

August 25 POST Code $ QA Plus Technical Forum. San Jose. JDR Microdevices. Call: (408)947-8881.

continued

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Basic System, Desktop	$399	$489	$539	$639	$789	$849	$749
w/ 40 MB 28 ms drive	$699	$789	$839	$939	$1,089	$1,149	$1,049
w/ 80 MB 25 ms drive	$949	$1,039	$1,089	$1,189	$1,339	$1,399	$1,299
SX16386 (386SX/16)							
Basic System, Desktop	$649	$739	$789	$889	$1,039	$1,099	$999
w/ 40 MB 28 ms drive	$949	$1,039	$1,089	$1,189	$1,339	$1,399	$1,299
w/ 65 MB 23 ms drive	$1,049	$1,139	$1,189	$1,289	$1,439	$1,499	$1,399
w/ 80 MB 25 ms drive	$1,199	$1,289	$1,339	$1,439	$1,589	$1,649	$1,549
w/ 120 MB 23 ms drive	$1,369	$1,459	$1,509	$1,609	$1,759	$1,819	$1,719
SM16386 (386SX/16)							
Basic System, Slim Case	$699	$789	$839	$939	$1,089	$1,149	$1,049
w/ 40 MB 28 ms drive	$999	$1,089	$1,139	$1,239	$1,389	$1,449	$1,349
w/ 65 MB 23 ms drive	$1,099	$1,189	$1,239	$1,339	$1,489	$1,549	$1,449
w/ 80 MB 25 ms drive	$1,249	$1,339	$1,389	$1,489	$1,639	$1,699	$1,599
w/ 120 MB 23 ms drive	$1,419	$1,509	$1,559	$1,659	$1,809	$1,869	$1,769
AX25386 (386/25)							
Basic System, Mini Vertical	$999	$1,089	$1,139	$1,239	$1,389	$1,449	$1,349
w/ 40 MB 28 ms drive	$1,299	$1,389	$1,439	$1,539	$1,689	$1,749	$1,649
w/ 65 MB 23 ms drive	$1,399	$1,489	$1,539	$1,639	$1,789	$1,849	$1,749
w/ 80 MB 25 ms drive	$1,549	$1,639	$1,689	$1,789	$1,939	$1,999	$1,899
w/ 120 MB 23 ms drive	$1,719	$1,809	$1,859	$1,959	$2,109	$2,169	$2,069
CX25386 (386/25, 32K cache)							
Basic System, Med Vertical	$1,299	$1,389	$1,439	$1,539	$1,689	$1,749	$1,649
w/ 40 MB 28 ms drive	$1,599	$1,689	$1,739	$1,839	$1,989	$2,049	$1,949
w/ 65 MB 23 ms drive	$1,699	$1,789	$1,839	$1,939	$2,089	$2,149	$2,049
w/ 80 MB 25 ms drive	$1,849	$1,939	$1,989	$2,089	$2,239	$2,299	$2,199
w/ 120 MB 23 ms drive	$2,019	$2,109	$2,159	$2,259	$2,409	$2,469	$2,369
w/ 150 MB 16 ms drive	$2,299	$2,389	$2,439	$2,539	$2,689	$2,749	$2,649
CX33386 (386/33, 64K cache)							
Basic System, Full Vertical	$1,699	$1,789	$1,839	$1,939	$2,089	$2,149	$2,049
w/ 40 MB 28 ms drive	$1,999	$2,089	$2,139	$2,239	$2,389	$2,449	$2,349
w/ 65 MB 23 ms drive	$2,099	$2,189	$2,239	$2,339	$2,489	$2,549	$2,449
w/ 80 MB 25 ms drive	$2,249	$2,339	$2,389	$2,489	$2,639	$2,699	$2,599
w/ 120 MB 23 ms drive	$2,419	$2,509	$2,559	$2,659	$2,809	$2,869	$2,769
CX25486 (486/25)							
Basic System, Full Vertical	$3,199	$3,289	$3,339	$3,439	$3,589	$3,649	$3,549
w/ 40 MB 28 ms drive	$3,499	$3,589	$3,639	$3,739	$3,889	$3,949	$3,849
w/ 65 MB 23 ms drive	$3,599	$3,689	$3,739	$3,839	$3,989	$4,049	$3,949
w/ 80 MB 25 ms drive	$3,749	$3,839	$3,889	$3,989	$4,139	$4,199	$4,099
w/ 120 MB 23 ms drive	$3,919	$4,009	$4,059	$4,159	$4,309	$4,369	$4,269

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ALR Powerflex 286-12 MHz, 1MB RAM, 40MB VGA Card + Display	$\$1625^{00}$
Mitsubishi 286/12MHz Laptop, 20 MB HD, 2400B Modem, Carrying Case, MS Works	$\$1895^{00}$
Toshiba T1000SE	$\$1125^{00}$

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Calendar Of Events *continued*

August 26 Computer Show & Sale. Hayward. East-West Computer Shows. Call: (415)388-8893.

August 27 Beginning Quark XPress Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

August 27 Microsoft Windows 3.0 Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 27 Wingz Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 27–29 Animator Seminar. San Francisco. San Francisco State University Extended Education. Call: (415)338-1205.

August 27–29 Novell Enhanced Support Training Course. San Francisco. SERVTEL. Call: (415)764-1400.

August 28 Ashton-Tate Seminar. San Ramon. 800–Software. Call: 1-800-888-4880.

August 28 Advanced Excel Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

August 28 Intermediate And Advanced Quark XPress Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

August 28 Hypercard II Class. San Francisco. Computer Alliance. Call: (415)771-7133.

August 28 dBASE IV Presentation. San Francisco. San Francisco Business Computers. Call: (415)788-5338.

August 28 Reseller & End-User Markets Presentation. Sunnyvale. Software Entrepreneurs' Forum. Call: Bill Bryant, (415)490-5583.

August 28–31 Object-Oriented Design & Programming Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

August 29 Letraset Color Seminar. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

August 29 How To Automate Your Business Seminar. San Rafael. Business Support Specialists. Call: (415)453-2856.

August 30 Microsoft Excel Class. San Francisco. Abacus, Inc. Call: Deborah Starnes, (415)759-9508.

SEPTEMBER

September 1 Building A PC Clone From Scratch Class. Oakland. Excel Micro Solutions. Call: (415)836-2040.

September 1 SeniorFest '90: A Showcase For SeniorNet Projects Conference. San Francisco. SeniorNet. Call: Kendra Henricks, (415)750-5030.

September 6 MacDraw II Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

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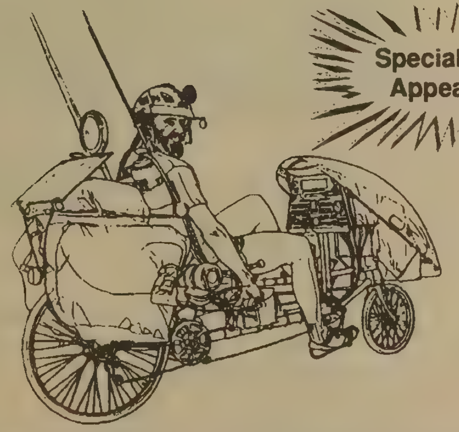

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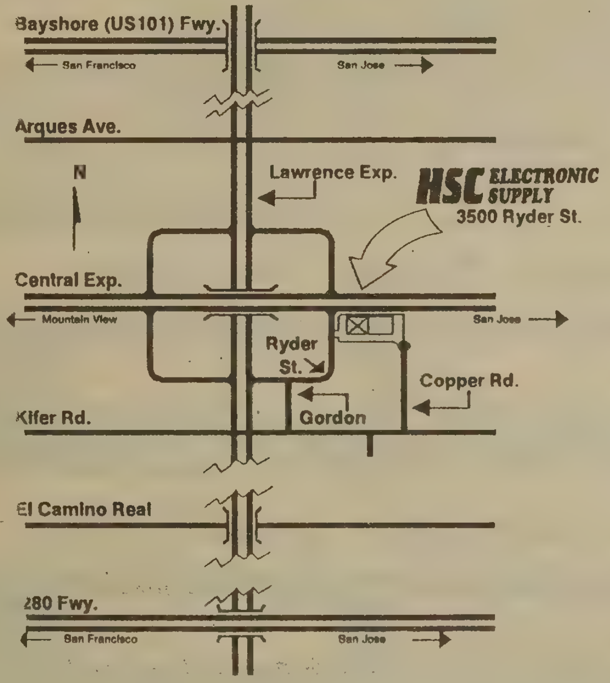

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Calendar Of Events *continued*

September 7 Aldus PageMaker 4.0 Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

September 7 Real Estate Management With IBM's Platinum Series: Computer Seminar. San Ramon. Howard M. Haberman Associates, Inc. Call: (415)641-0850.

September 8 Computer Swap. Santa Clara. Computer Swap. Call: 1-800-433-7469.

September 8 Computer Mart. Cupertino. De Anza College. Call: (408)864-8581.

September 8 Building A PC Clone From Scratch Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

September 9 Swap Meet. San Francisco. Apple Core. Call: (415)771-5830.

September 9 Computer Show & Sale. Hayward. East-West Computer Shows. Call: (415)388-8893.

September 9 MiBAC, Software For Jazz Improvisation Demo. Palo Alto. MuSIG. Call: Glenn Spencer, (415)858-1493.

September 9–12 Open Systems Applications Development Conference. San Jose. Unify Corp. Call: 1-800-247-0262.

September 10–13 NetWorld '90 Expo. Dallas. H.A. Bruno, Inc. Call: 1-800-444-3976.

September 11 Real Estate Management With IBM's Platinum Series: Computer Seminar. San Jose. Howard M. Haberman Associates, Inc. Call: (415)641-0850.

September 11 Business And Point Of Sale Presentation. San Francisco. IICS. Call: (408)866-7941.

September 11–12 SQL Proficiency Seminar. Santa Clara. Database Programming & Design. Call: Lynne Mariani, (415)995-2471.

September 11–14 Distributed Databases: Design, Implementation & Management Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421–8166.

September 12–14 Moving From C To C++ Class. San Jose. Arix and Berkeley Decision/Systems. Call: (408)458-9708.

September 14–19 AppleFest/ComputerFest '90 West. San Francisco. Exposition Management, Inc. Call: 1-800-262-FEST.

September 15 Computer Show & Sale. Vallejo. East-West Computer Shows. Call: (415)388-8893.

September 15 IBM PC Clone Troubleshooting And Repair Class. Oakland. Excel Micro Solutions. Call: Luis Lopez, (415)836-2040.

September 15–18 First International Multimedia Conference. New York. MultiMedia Computing Corp. Call: 1-800-248-5474.

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- 101 Extended Keyboard
- 1.2 MB TEAC Floppy Drive
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- 1.2 MB TEAC Floppy Drive
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- 1:1 Interleave Controller with 28MS 40 MB Hard Drive

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XT-4380E	**1650**

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NEC MULTI SYNC 2A	**460**
SEIKO VGA-1440	**585**
NEC MULTI SYNC 3D	**599**

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MULTI I/O	**52**
MEMORY CARD	**42**
PARALLEL CARD	**20**
RS-232	**24**
GAME I/O	**15**
EVEREX 1200 MODEM	**70**
EVEREX 2400 MODEM	**124**

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1 MB	**$195**
2 MB	**275**
4 MB	**400**
FOR LASERJET II III 2 MB	**245**

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POSTSCRIPT IIP	**$365**
HPGL	**245**
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172 FONTS	**265**

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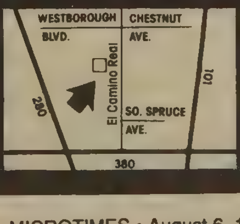

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- **Vallejo** - Sat. Aug. 18 Solano Co. Fairgrounds
- **Sacramento** - Sun. Aug. 19 Scottish Rite Temple
- **Hayward** - Sun. Aug. 26 Centennial Hall
- **Hayward** - Sun. Sept. 9 Centennial Hall

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Calendar Of Events *continued*

September 18–21 CASE: Computer-Aided Software Engineering Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421–8166.

September 18–21 Image Processing & Machine Vision Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 18–21 Project Management: Skills For Success Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 18–21 UNIX Hands-on Workshop Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421–8166.

September 19 Lotus Seminar. San Francisco. 800–Software. Call: Lisa, (415)421-7013.

September 19 How To Automate Your Business Accounting System Seminar. San Francisco. J.C. Lukrich and Co., CPA. Call: Suzette, (415)864-6770.

September 19 The Future In 2–D/3–D Graphical Software Presentation. Palo Alto. Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219.

September 20 Accounting Systems Seminar. Oakland. David A. Simon, CPA. Call: (415)893-5753.

September 22 Computer Swap. San Francisco. Computer Swap. Call: 1-800-433-7469.

September 22 Building A PC Clone From Scratch Class. Oakland. Excel Micro Solutions. Call: (415)836-2040.

September 23 Computer Show & Sale. Santa Rosa. East-West Computer Shows. Call: (415)388-8893.

September 23 Computer Show. San Francisco Fort Mason Shows. Call: (916)725-0228.

September 25 Ventura Publisher For Windows Presentation. San Francisco. San Francisco Business Computers. Call: (415)788-5338.

September 25–27 PC Expo. Chicago. H.A. Bruno, Inc. Call: 1-800-444-3976.

September 25–28 Embedded Systems Conference. Burlingame. Embedded Systems Programming. Call: (415)995-2471.

September 25–28 C Advanced Programming & Data Structures Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 25–28 Multivendor Networking Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 25–28 Network Cabling And Wiring Techniques Course. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

September 26 How To Automate Your Business Accounting System Seminar. San Francisco. J.C. Lukrich and Co., CPA. Call: (415)864-6770.

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MODEL	MEMORY	PART NUMBER	LIST PRICE	ATICO PRICE
IBM PS/2				
25	128K KIT	78X8955	$ 50	$ 37
30/286, 50,60	512K KIT	30F5348	$ 200	$ 69
	2MB KIT	30F5360	$ 795	$ 219
55SX	1MB MODULE	6450603	$ 450	$ 129
50Z,55SX, 65SX	2MB MODULE	6450604	$ 950	$ 285
55SX,65SX	4MB MODULE	34F2933	$2,195	$ 722
50, 50Z, 55SX, 65SX	2-8MB EXP BRD w/2MB	1497259	$1,350	$ 595
	2-8MB EXP BRD w/4MB	1497259+	$2,040	$ 938
	2-8MB EXP BRD w/6MB	1497259+	$2,830	$1,201
	2-8MB EXP BRD w/8MB	1497259+	$3,620	$1,463
70-E61, 70-061, 70-121	1MB MODULE	6450603	$ 450	$ 110
	2MB MODULE	6450604	$ 950	$ 285
			**6450605 Required*	
70-A21,A61, B21,B61	1MB MODULE	6450603	$ 450	$ 110
	2MB MODULE	6450604	$ 950	$ 285
	2MB MODULE	6450608	$ 950	$ 285
			**6450605 Required*	
70-All Models	2-8MB EXP BRD w/2MB	6450605	$1,295	$ 489
	2-8MB EXP BRD w/4MB	6450605+	$2,890	$ 888
80-All Models	2-8MB EXP BRD w/6MB	6450605+	$4,185	$1,147
	2-8MB EXP BRD w/8MB	6450605+	$5,480	$1,406
80-041	1MB BOARD	6450375	$ 675	$ 165
80-041,071	2MB MODULE	6450372	$1,295	$ 499
80-A21,A31	4MB BOARD	6451060	$1,895	$ 778
80-All Models	1MB MODULE	6450603	$ 450	$ 129
	2MB MODULE	6450604	$ 950	$ 285
	2MB BOARD	6450379	$ 950	$ 429
	4MB MODULE	34F2933	$2,195	$ 722
			**6450605 Required*	
PORTABLE P70	2MB MODULE	6450604	$ 950	$ 285
4019/E LASER PRINTER	1MB MODULE	1039136	$ 450	$ 210
	2MB MODULE	1039137	$ 850	$ 347
	3.5MB MODULE	1038675	$1,495	$ 516
COMPAQ				
DESKPRO 286E	1MB MODULE	113131-001	$ 450	$ 164
	4MB MODULE	113132-001	$1,950	$ 465
DESKPRO 386/16	1MB KIT	108071-001	$ 635	$ 239
	4MB KIT	108072-001	$2,550	$1,248
	1-2MB EXP BRD w/1MB	108069-001	$ 650	$ 412
	4-8MB EXP BRD w/4MB	108070-001	$2,550	CALL
DESKPRO 386S	1MB MODULE	113646-001	$ 450	$ 164
	1MB BOARD	113633-001	$ 650	$ 238
	4MB MODULE	112534-001	$1,950	$ 475
	4MB BOARD	113634-001	$2,395	$ 595
DESKPRO 386/20,25	1MB MODULE	113131-001	$ 450	$ 164
	4MB MODULE	113132-001	$1,950	$ 465
DESKPRO 386/20E,25E	1MB MODULE	113131-001	$ 450	$ 139
	1MB BOARD	113644-001	$ 650	$ 240
	4MB MODULE	113132-001	$1,950	$ 465
	4MB BOARD	113645-001	$2,395	$ 595
DESKPRO 386/33	2MB MODULE	115144-001	$ 950	$ 299
DESKPRO 486/25, SYSTEM PRO	2MB MODULE	115144-001	$ 950	$ 299
	8MB MODULE	116561-001	$5,195	$2,282
PORTABLE 386	1MB KIT	107651-001	$ 650	$ 259
	4MB BOARD	107653-001	$2,395	$ 985
	4MB EXT BOARD	107654-001	$2,395	$ 985
PORTABLE III	512K KIT	107331-001	$ 269	$ 49
	2MB KIT	107332-001	$1,100	$ 325
PORTABLE LTE	512K BOARD	117077-001	$ 295	$ 197
	1MB BOARD	117081-001	$ 650	$ 239
	2MB BOARD	117081-002	$1,250	$ 385
SLT/286	1MB BOARD	110235-001	$ 650	$ 296
APPLE MAC				
PLUS,SE, SE30,II	1MB KIT	MO218	$ 250	$ 99
	2MB KIT	MO219	$ 450	$ 140
	4MB KIT	MO2707		$ 298
IIci	4MB KIT	MO292LL-A	$ 950	$ 296
	4MB MODULE			$ 546
	16MB KIT		$6,995	$2,685
IIcx	1MB KIT	MO218	$ 250	$ 76
	2MB KIT	MO219	$ 450	$ 140
	4MB KIT	MO2707		$ 288
	4MB MODULE			$ 546
IIfx	4MB KIT	MO376LL-A	$ 950	$ 548
	16MB KIT		$6,995	$2,685
PORTABLE	1MB KIT	MO248	$ 630	$ 434
	4MB MODULE			$2,999
LASERWRITER II/NTX	1MB EXP KIT	M6005	$ 450	$ 268
	4MB EXP KIT	M6006	$ 950	$ 536
AST RESEARCH				
BRAVO 286	128K KIT	500510-011	$ 50	$ 42
	512K KIT	500510-010	$ 135	$ 65
	2MB KIT	500510-002	$ 345	$ 174
BRAVO 386SX	512K KIT	500510-010	$ 135	$ 65
	2MB KIT	500510-002	$ 345	$ 174
PREMIUM 286 ADVANCED	1MB KIT	500510-007	$ 260	$ 118
	2MB KIT	500510-002	$ 345	$ 174
PREMIUM WS286/WS386SX	512K KIT	500510-010	$ 135	$ 65
	2MB KIT	500510-002	$ 345	$ 174
PREMIUM 386SX/16, 386/25	1MB MODULE	500718-001	$ 195	$ 103
	1-16MB EXP BOARD	500722-004		$ 562

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MODEL	MEMORY	PART NUMBER	LIST PRICE	ATICO PRICE
AST RESEARCH *Continued*				
PREMIUM 386/33	1MB MODULE	500718-002	$ 195	$ 139
	1-16MB EXP BOARD	500722-004		$ 562
PREMIUM 386/16,386C	1MB KIT	500510-007	$ 260	$ 125
	4MB KIT	500510-008	$ 675	$ 335
PREMIUM 486	2MB MODULE	500718-004	$ 850	$ 323
PREMIUM 486/25,25E, 25T,25TE, 33	1MB MODULE	500718-002	$ 195	$ 139
	1-16MB EXP BOARD	500722-004		$ 562
AT&T (WGS SYSTEM)				
6286	2MB UPGRADE	37727	$1,195	$ 299
6386,6386E	1MB UPGRADE	37714	$ 750	$ 199
	4MB UPGRADE	37716	$2,795	$ 550
6386/SX, 6386/25&33	2MB UPGRADE	37336	$1,195	$ 290
EPSON				
EQUITY IIc, 386/20	1MB KIT	A808091	$ 450	$ 192
	1MB KIT	A808231	$ 450	$ 222
	2MB KIT	A808101	$ 995	$ 321
386SX	1MB KIT	A808231	$ 450	$ 222
	2MB KIT	A808101	$ 995	$ 321
HP VECTRA SYSTEM				
VECTRA QS/16S	1MB KIT	D1540A	$ 595	$ 220
	2MB KIT	D1354A	$1,195	$ 295
	4MB KIT	D1542A	$2,495	$ 588
VECTRA ES/12PC	2MB KIT	D1354A	$1,195	$ 295
VECTRA QS/20S, RS/25PC	1MB KIT	D1640A	$ 595	$ 295
	4MB KIT	D1642A	$2,495	$ 583
VECTRA 486PC	2MB KIT	Two D2150A	$ 595	$ 325
	8MB KIT	Two D2151A	$2,495	$1,945
	16MB KIT			$3,993

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HP LASER PRINTER				
LASER JET II,IID	0MB BOARD			$ 99
	1MB BOARD	H33443B	$ 485	$ 148
	2MB BOARD	H33444B	$ 775	$ 218
	4MB BOARD	H33445B	$1,450	$ 378
LASER JET IIP,III	0MB BOARD			$ 117
	1MB BOARD	H33474B	$ 485	$ 188
	2MB BOARD	H33475B	$ 890	$ 286
	3MB BOARD	H33476B		$ 399
	4MB BOARD	H33477B		$ 438
NEC				
POWER MATE 386SX	4-8MB EXP BRD		$2,295	$ 842
TOSHIBA PORTABLE/LAPTOP				
T1000SE	1MB CARD	PC14-PA8311U		$ 415
	2MB CARD	PC14-PA8312U	$1,199	$ 688
T1600	2MB BOARD	PC8-PA8302U	$1,190	$ 280
T3100	2MB KIT		$1,190	$ 699
T3100E	512K KIT	PC9-PA8340U	$ 350	$ 178
	2MB KIT	PC9-PA8341U	$1,190	$ 286
T3100SX	2MB BOARD	PC15-PA8308U	$ 950	$ 419
	4MB BOARD			$1,088
T3200	3MB BOARD	PC6-PA7137U	$1,590	$ 492
T3200SX	2MB KIT	PC12-PA8307U	$ 990	$ 286
	4MB KIT			$ 950
T5100	2MB BOARD	PC7-PA8301U	$1,190	$ 280
T5200/T8500	2MB KIT	PC10-PA8304U	$ 950	$ 286
ZENITH				
Z248	2MB MODULE	Z605-1	$1,299	$ 389
Z386/20,25	1MB MODULE	ZA3600-ME	$ 899	$ 146
	2MB MODULE	ZA3600-MG	$1,299	$ 264
	4MB KIT	ZA3600-MK	$2,695	$ 684
SUPERSPORT 286	1MB KIT	ZA180-66		$ 368
	1MB BOARD			$ 288
	1MB EXP CARD	7PC-16AC		$ 215
	4MB KIT	ZA180-67		$1,119
SUPERSPORT 386SX	2MB BOARD	ZA180-86		$ 532
TURBOSPORT 386	1MB KIT	ZA3034-ME		$ 369

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MODEL	MEMORY	PART NUMBER	LIST PRICE	ATICO PRICE
APOLLO				
DN3000	2MB BOARD		$2,000	$ 995
DN3500,DN4000 DN4500	4MB BOARD		$3,000	$1,680
	8MB BOARD		$6,500	[illegible]
DATA GENERAL				
AVIION SERIES	4MB BOARD		$3,000	[illegible]
DEC				
DECStation 2100, DECStation 3100	4MB KIT	MS01-AA	$2,500	$ 899
VAXStation 3100, MicroVAX 3100	8MB BOARD	MS42-KA	$3,995	$1,567
	12MB ADD-ON	MS42-BA	$5,995	$2,197
	12MB EXP BRD		$5,995	$2,530
	16MB BOARD	MS42-CA	$7,950	$2,985
VT100 TERM.	1MB BOARD	VX10X-MA	$ 395	$ 315
VT100 BOARD	1MB MODULE	VX10X-MD	$ 395	$ 299
HP WORKSTATION				
HP-9000/200,300	2MB BOARD		$2,200	$1,080
	4MB BOARD		$3,000	$1,284
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	16MB KIT	HU9C16B	$7,900	$2,643
PROFESSIONAL 4D/40/50/70/80 CS/12 TURBO12/16	4MB KIT	H4C04B	$1,650	$ 499
	16MB KIT	HU9C16B	$7,900	$2,643
POWER SERIES 4D/120/220/240/280	8MB KIT	H4C08X	$3,900	$1,906
SUN				
3/60,3/80,4/60, SPARC 1	4MB OPTION	X104C,-G,-H	$1,895	$ 625
4/110	16MB OPTION	X116D	$7,700	$2,386
SPARC 4/60, 4/330,4/370	16MB OPTION	X116H	$5,600	$2,783
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BUSINESSMATE 386/25 1.2MB floppy drive, 25 MHz, 128KB ROM standard, 32KB (25ns) SRam cache

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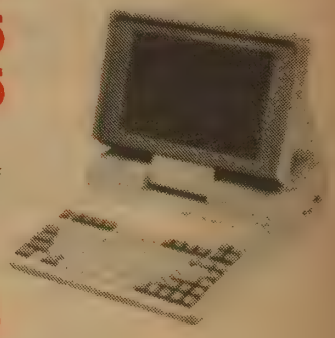

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September 26 Microsoft Windows 3.0 Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

September 27 Ventura Publisher Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

September 28 dBASE IV Class. San Ramon. Adelphi Corp. Call: Tom Phipps, (415)275-1188.

September 28–29 Sources 1990: Asian Financing For Emerging Companies Conference. Santa Clara. Asian American Manufacturers Assoc. Call: (415)321-2262.

September 29 Money Managers Technical Forum. San Jose. JDR Microdevices. Call: Dan Urioste, (408)947-8881.

September 29 Computer Swap. Oakland. Computer Swap. Call: 1-800-433-7469.

September 29 Computer Show & Sale. San Mateo. East-West Computer Shows. Call: (415)388-8893.

September 30 Computer Show & Sale. Oakland. East-West Computer Shows. Call: (415)388-8893.

OCTOBER

October 2–5 SQL: Hands-on Workshop. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

October 2–5 1990 Seybold Computer Publishing Conference & Expo: The Evolving Process Of Communication. San Jose. Seybold Seminars. Call: (213)457-5850

October 4–6 "The Next Wave" In Newspaper Design Convention. San Francisco. Society in Newspaper Design. Call: (415)777-7968.

October 6 IBM PC Clone Troubleshooting And Repair Class. Oakland. Excel Micro Solutions. Call: (415)836-2040.

October 8–12 Interop '90 Expo. San Jose. Interop, Inc. Call: 1-800-INTEROP, ext. 200.

October 9 The Business Of Learning Presentation. Cupertino. IICS. Call: (408)866-7941.

October 9–12 Microprocessor Software, Hardware And Interfacing: Hands-on Intro. Class. San Francisco. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

October 10 Project Management Comparison Seminar. San Francisco. 800–Software. Call: 1-800-888-4880.

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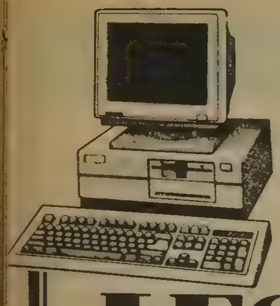

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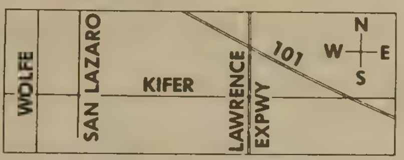

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Wishing Well. (415)745-7901. 24 hrs., 300/1200/2400. Message, email, games, files, matchmaking, no fee. Sysop: MaryLou White. [Exp. #73.]

Zone BBS. (415)965-3556. 8-N-1, 24 hrs., 1200/2400. 122Mb online, Fidonet, online gaming, supports all computers. Sysop: Ron Schultz. [Exp. #74.]

707

The Darkside of the Moon BBS. (707)451-3323. 8-N-1, 24 hrs., 300/1200/2400/9600. 140 megs. Running Wildcat! multi-chat, game doors, email, shareware. Sysop: Stephen Cannon. [Exp. #74.]

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Drug Abuse Information (DAIMP). 1-800-825-3736. 8-N-1, 24 hrs., 300/1200/2400. Drug information, statistics, bibliographies, forums, email, downloads and uploads. Free membership, reg. requested. Sysop: Greg Cason. [Exp. #73.]

USER GROUPS

3COM

Bay Area 3Com User Group. Call: Ryan Cornin, (408)957-0943, or 354-7804. [Exp. #73.]

ACCOUNTING

Computer Associates User Group. Meetings: 1st month of quarter on 3rd Wed., Holiday Inn, 1500 Van Ness. Come share ideas and information with other local users of Computer Associates Accounting Software! Call: Beth E. Markus, (415)864-6770. [Exp. #75.]

San Francisco Bay Area Platinum User Group. Call: Steve Koss, (415)562-2754, or Jim Britton, (415)576-3209. [Exp. #75.]

AMIGA

ALF—Amiga Learners Forum. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. Beginners group. [Exp. #73.]

Amiga ACCESS (Amiga & Commodore Computer Enthusiasts Society). Meetings: 2nd Thurs., 7:00 pm, Livermore/Pleasanton. PD libraries. Call: Paul, (415)829-6053. [Exp. #73.]

ASCITEC: The Amiga Science & Technology Users Group. Meetings: 2nd Thurs., 5-7 pm, Lockheed, B/157, Rm. 4-C, Sunnyvale. Scientific/Video Applications. Classes available. Call: (408)756-4268. [Exp. #74.]

AUM—Amiga Users Of Marin. Meetings: 3rd Wed., 7:30 pm, College of Marin, Science Center, Room 190. Call: Bob Galvan, (415)924-5384. [Exp. #74.]

AWEST Amiga Users. Meetings: 1st Wed., 7:00 pm, Computer Showcase, Geary at Masonic. Call: (415)584-8406. [Exp. #73.]

Northern California Amiga Club. Meetings: 2nd Sat., 2:00 pm, Rico's Pizza, 200 Hartnell, Redding. Call: (916)472-3237. [Exp. #75.]

Valley Computer Club (VCC). Meetings: 1st Wed., Turlock Jr. High School. C64/C128 Amiga and Commodore MS-DOS users group. Call: (209)529-8473 or 668-8636. [Exp. #75.]

APL

APL Bay Area Users Group. Meetings: 2nd Mon., 7:00 pm, variable. Call: Tibor Horvath, (415)283-5611. [Exp. #75.]

APPLE

ABUG—Apple Blossom User Group. Meetings: Apple II Group 1st Wed., Mac Group 3rd Wed. Write for info: P.O. Box 53323, San Jose, 95123. Call: (408)395-7900. [Exp. # 74.]

Apple II SIG. Meetings: 4th Thurs., 7:30 pm, Lynbrook High, 1280 Johnson Ave. (W. San Jose). Call: Fred Bernal, (408)258-0284. [Exp. #74.]

Apple IIGS SIG. Meetings: 3rd Tues., 7:00 pm, Wilcox High, 3250 Monroe St., Santa Clara. Call: Dave Cone, (415)322-7867. [Exp. #74.]

Apple SAC—Apple II. Meetings: 1st Wed. and 3rd Tues. Call: (916)991-7313. [Exp. #75.]

Appleworks SIG. Meetings: 4th Tues., 7:00 pm, Wilcox High, 3250 Monroe St., Santa Clara. Call: Egon Jensen, (408)356-2660. [Exp. #74.]

San Francisco State Univ. Apple Core. Meetings: 2nd Tues., 7:00 pm, Hensill Hall, Rm. 205. An Apple II user group. BBSes, newsletter, demos, mentoring, swaps, DTP and telecom sub groups. Call: (415)771-5830. [Exp. #75.]

Tri Valley Apple II User Group. Meetings: 1st Thurs., 6:30 pm. Call: Dan Balsey, (415)828-6237 for meeting location. [Exp. #73.]

AT&T UNIX

AT&T Computer User Group-North Bay. Meetings: 1st Wed., new user education, 6:00 pm, program, 7:00 pm, San Francisco AT&T Bldg., 50 Fremont St. Call: Joe Mahoney, (415)584-6510; BBS (415)829-6027. [Exp. #77.]

AT&T Computer User Group-South Bay. Meetings: 3rd Wed., new user education, 6:00 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Joe Lipsig, (408)733-6522; BBS (408)946-7734. [Exp. #77.]

AT&T UNIX Computer User Group-South Bay. Meetings: 4th Wed., new user education, 6:30 pm, program, 7:00 pm, Sunnyvale AT&T Bldg., 1090 E. Duane Ave. Call: Thad Floryan, (408)985-7100; USENET, thad@cup.portal.com. [Exp. #77.]

COAST (CA Original Atari ST User Group). Meetings: 3rd Wed., 6:30 pm, Berkeley Conference Center, 2105 Bancroft Way. Call: (415)945-1949. [Exp. #75.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Community Library. Call: Keith Simmons, (415)887-2008. [Exp. #75.]

ATARI

ABACUS (Atari Bay Area Users Society). Meetings: 1st Sat. Call for place/time, (415)753-8483. [Exp. #74.]

Bay Area Atari Users Group (BAAUG). Meetings: 1st Mon., 7:30 pm, Agnews Hospital Auditorium, Palm Rd. and Circle Dr., San Jose. Call: Joe Fischer, (408)988-3065. [Exp. #77.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Community Library. Call: Keith Simmons, (415)887-2008. [Exp. #75.]

South County Atari User Group. Meetings: 2nd Wed., 7:00 pm, San Jose Computers. Call: C. Ron Reade, (408)225-7162. [Exp. #77.]

ST-ACE (Atari Computer Enthusiasts). Meetings: 3rd Thurs., 7:00 pm, Baptist Church on Sebastepol Rd., Santa Rosa. Call: Hal Andersen, (707)542-1745. [Exp. #73.]

AUTOCAD

AutoCAD DCA Engineering Software Users Group. Meetings: 3rd Wed. Call for location. Call: Mike Foley, (415)734-0707. [Exp. #73.]

CAD/CAM

SF Bay Area C.A.S.E. Users Group. Meetings: Once per quarter. Call: David Plotkin, (415)842-6706. [Exp. #75.]

Textile Computer Users Group—TCUG. Meetings: Bimonthly, 1st Sun., 10:00–noon. Bedford Hotel, San Francisco. Call: (415)284-1635. [Exp. #75.]

COMMODORE

Cupertino Chapter Of 64/More Commodore User Group. Meetings: 3rd Sun., 6:00 pm, Cupertino Library. Call: (408)262-9334. [Exp. #75.]

CWEST Bay Area Commodore Users Group. Meetings: 3rd Wed., 7:00 pm, H. Hoover Mid School. Call: (415)626-9946; BBS: (415)431-4829. [Exp. #73.]

CWEST—Commodore 64/128. Call: (415)626-9946. [Exp. #75.]

Fairfield Commodore User Group. Meeting: 1st and 3rd Mon., 7:30 pm, Solano County Board of Education Bldg., Texat St., Fairfield. Amiga, Commodore 64, 128, PC-40-III. Call: (707)427-6805 or Newsshop BBS (707)446-7235. [Exp. #75.]

North Valley Chapter Of 64/More Commodore User Group. Meetings: 2nd Sat., 10:00 am, Milpitas Library. Call: (408)262-9334. [Exp. #75.]

San Jose Chapter Of 64/More Commodore User Group. Meetings: 1st Sun., 6:00 pm, Mercury Savings on Blossom Hill. Call: (408)262-9334. [Exp. #75.]

dBASE

Clipper SIG. Meetings: 3rd Tues., 8:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: J.R. Whiple, (408)243-2796. [Exp. #73.]

Database Design SIG. Meetings: 3rd Tues., 7:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Mark Gerow, (408)326-3364. [Exp. #73.]

DataEase User Group. Meetings: 4th Thurs., 3:30 pm, 101 Montgomery St. Call: (415)945-7817. [Exp. #75.]

dBASE IV SIG. Meetings: 1st Tues., 7:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Fletcher Johnson, (408)283-1333. [Exp. #77.]

dBXL/Quicksilver SIG. Meetings: 3rd Tues., 8:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Karl Snyder, (408)846-1814. [Exp. #73.]

FoxBase/FoxPRO SIG. Meetings: 3rd Tues., 8:00 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. Special interest group of the Silicon Valley dBASE Language Group. Call: Mark Scaramella, (408)288-8423. [Exp. #73.]

Silicon Valley dBASE Language Group. Meetings: 2nd Tues., 6:30 pm, Ernst & Young, 55 Almaden Blvd. (Plaza Bank Bldg), San Jose. A non-profit volunteer organization dedicated to the education and development of database users and professionals. Call: Michael Masterson, (408)972-4889. [Exp. #73.]

SQL_Forum. Meetings: 1st Thurs., 6:30 pm, 394 Pacific Ave., San Francisco. Discusses client/server computing and SQL database servers. Speakers, demos. Call: (415)695-2748. [Exp. #77.]

Ventura SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #73.]

DESKTOP PUBLISHING

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: Phil Smith, (415)391-1333. [Exp. #77.]

EAGLE

Eagle Computer Users Group. Meetings: 2nd. Sat., 9:00-12 noon, Tandem Computer, 10435 N. Tantau Ave., Cupertino. Call: (408)972-1965. [Exp. #73.]

EPSON

Bay Area Epson Salts. Meetings: 2nd Tues., 7:30 pm, 2611 Broadway, Redwood City. Call: Joe, (415)364-9232, or Tom, (415)992-5475. [Exp. #73.]

FOCUS

NC FUSE—Northern California FOCUS Users. Meetings: quarterly. P.O. Box 61325, Sunnyvale, CA 94088-1325. Sharing FOCUS knowledge and experience. [Exp. #73.]

GENEALOGY

Family Roots Genealogy Program User Group. Meetings: Jan, March, May, July, Sept, & Nov. For info: Joseph L. Rick, 135 Leslie Dr., San Carlos, CA 94070-3459. Include SASE. [Exp. #74.]

IBM AND COMPATIBLES

Beginners SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)211-9166. [Exp. #77.]

C Language SIG/SFPCUG. Meetings: 2nd Mon. Call: Victor Pribyl, (415)355-8325. [Exp. #77.]

Columbia SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 3333 California St., San Francisco. Call: Dennis Tye, (415)566-0587. [Exp. #77.]

Columbia SIG/SFPCUG. Meetings: 3rd. Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)566-0587. [Exp. #77.]

Desktop Publishing SIG/SFPCUG. Meetings: 3rd Tues., 6:30 pm, 660 Market St., Ste. 215, San Francisco. Call: (415)391-1333. [Exp. #77.]

DESQView SIG/SFPCUG. Meetings: 3rd Mon., 6:15 pm, UCSF, 3333 California St., San Francisco. Call: Jerry Stern, (415)387-2298. [Exp. #77.]

EastBay FOG. Meetings: 3rd Wed. All microcomputers, MS-DOS, CP/M. Call: (415)272-9099. [Exp. #75.]

Investment Software Association, a SIG of San Francisco Business Computers. Meet-

PROFESSIONAL ASSOCIATIONS

Artificial Intelligence Association. Individuals interested in learning about the use and application of AI. Call: Rita Zokaei, (415)574-8225. [Exp. #75.]

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Independent Computer Consultants Assn. Referral Service. Designed to give public access to the knowledge and experience of Assoc. members, no fee. Call: Referral Service Hotline, (408)980-7272. [Exp. #77.]

Independent Computer Consultants Association. Meetings: 3rd Wed., 6:00 pm. Meetings are open to non-members and members. Call: ICCA, (415)441-2948. [Exp. #75.]

Rracsa, For Sysops & Users. Meetings: 2nd Tues., 6:30 pm, CoCo's Restaurant, 1305 S. Mary, Sunnyvale. Call: Irv Hoff, (415) 948-2166. [Exp #73.]

Software Entrepreneurs' Forum. Call: Barbara Cass, (415)854-7219. [Exp. #75.]

United Sysops Association (U.S.A.). Meetings: 2nd Wed., 7:00 pm, call for location. SIG for BBS sysops and users. Call: Bill Strouse, (415)453-3321. [Exp. #75].

Women's Computer Society. Call: Tanya Halepota, (415)949-3936. [Exp. #75.]

Writer's On-line Association Of Technical Communicators. Meetings: Weekly, Berkeley. Call: Cynthia Kolnick, (415)673-5819. [Exp. #75.]

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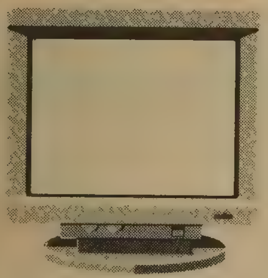

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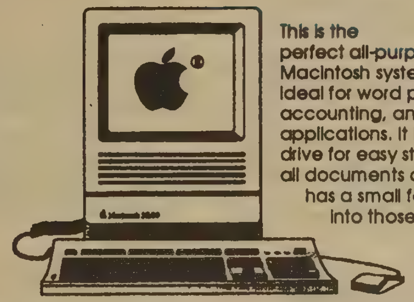

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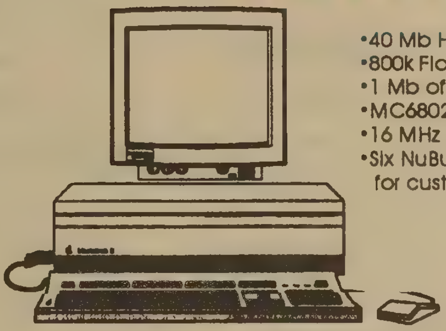

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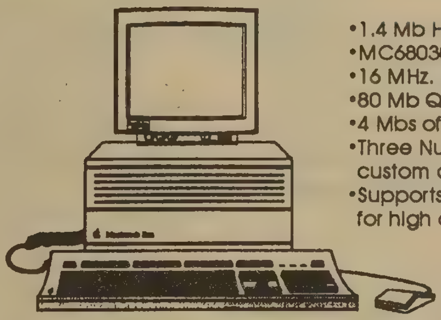

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Lotus SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)282-4100. [Exp. #77.]

MS Word SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)929-1993. [Exp. #77.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm, Buck's lower plaza, 10 Chapel Hill Dr. Call: Bob Kulas, (707)255-9241. [Exp. #73.]

New Users SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)457-0729. [Exp. #75.]

P.I.E. IBM And Compatibles SIG. Meetings: 3rd Wed., 7:30 pm, General Disk Corp., 1530 Montague Expwy. Call: Clay Walker, (408)736-7704. [Exp. # 74.]

PC Clone Users Group. Meetings: 2nd Mon., 7:00 pm, Fort Mason Center, Bldg. E, Rm. 287. BBS: (415)621-8425. Call: (415)861-9321. [Exp. #73.]

PC Professionals SIG/SFPCUG. Meetings: 2nd Thurs., 6:15 pm, Call: Kendall Callas, (415)821-1310. [Exp. #77.]

Peninsula Computer Club—"KayFun." Meetings: 2nd Thurs., 7:30 pm, Social Room, Lauren St., San Carlos. CP/M and DOS libraries. Call: BBS: (415)571-9259. Voice: 593-9981. [Exp. #73.]

Peninsula Computer Club—KayFun. Meetings: 2nd Thurs., 7:30 pm, Social Room, 222 Laurel St., San Carlos. DOS and CP/M libraries. Call: (415)593-3391 or BBS (415)571-9259. [Exp. #77.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm, Donatello Hotel at Post and Mason. Call: (415)788-5388. [Exp. #77.]

San Francisco Computer Society. Meetings: 1st Mon., 1350 7th Ave., San Francisco. Call: (415)929-0250. [Exp. # 74.]

San Francisco PC Users Group. Meetings: 3rd Mon., 3145 Geary Blvd., Ste. 155, San Francisco. Call: (415)221-9166. [Exp. #77.]

Teachers SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)982-4221. [Exp. #75.]

TRS Nybblers. Meetings: 2nd Fri., 8:00 pm, Chabot College, Bldg 1560. MS-DOS, UNIX, OS-9, CP/M. BBS (415)352-8442. Call: Ken Bailey, (415)462-4442. [Exp. #74.]

WordPerfect SIG/SFPCUG. Meetings: 3rd Mon., 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)821-1310. [Exp. #77.]

KAYPRO

Peninsula Computer Club—"KayFun." Meetings: 7:30 pm, Social Room, Lauren St., San Carlos. CP/M and DOS libraries. Call: (415)571-9259. Voice: 593-9981. [Exp. #73.]

KNOWLEDGE-MAN

Bay Area KnowledgeMan (And Guru) User Group. Meetings: 1st Tues., 6:30 pm, JNZ, Inc., Lafayette. A forum for discussion and info. concerning mdbs products, esp. KnowledgeMan and Guru. Call: (415)947-4878. [Exp. #75.]

LAPTOPS

Bay HPX HP Laptops & Handhelds. Meetings: 2nd Sat. Call: Michael Felsenstein, (415)564-8279. [Exp. #74.]

MACINTOSH

AHUG—Apple Hypercard Users Group. Meetings: 1st Fri., 7:00 pm, Cupertino. Guest speakers & stack downloading. Call: (408)974-1707 [Exp. # 74.]

MacDiablo Macintosh Users Group (MDUG). Meetings: 4th Wed., 7:30 pm, Community Rm., Glendale Federal Bank, 3001 Crow Canyon Rd., San Ramon. Call: Harvey Scudder, (415)828-4995, Rym Maggiora, 829-5501. [Exp. #73.]

Macintosh Application Group. Meetings: TBA. Call: (415)751-9185. Main focus is application support for the user and language programming, all levels. Newsletter is in the making. [Exp. #73.]

MacSEF. Meetings: 3rd Tues., 7:00 pm, Call: Tony Meadow, (415)644-9400. [Exp. #75.]

North Coast Mac Users Group. Meetings: 3rd Wed., 7:30 pm, Sonoma State University, Darwin Hall, Rm. 108. Not a student organization, annual dues for individuals and businesses. Call: Reed Hopkins, (707)542-1089. [Exp. #74.]

P.I.E. Macintosh SIG. Meetings: 2nd Thurs., 7:00 pm, Institute of Computer Technology, 1196 Lime Dr., Sunnyvale. Call: John Alston, (408)735-8247. [Exp. #74.]

Peninsula Apple/Macintosh Users Group. Meetings: 3rd Thurs., Ampex cafeteria, Redwood City. Call: Les Dyer, (415)591-2124. [Exp. #75.]

MULTIMEDIA

The International Interactive Society—IICS. Meetings: 2nd Tues., 7:00 pm, UCSF Laurel Heights Conference Center. Call: (415)328-7318. [Exp. #75.]

MUSIC

MuSIG. Meetings: 1st Sun., 2:00 pm. Various locations. Call: (415)858-1493. [Exp. #75.]

NETWARE

Central Valley NetWare User Group. Meetings: To be determined. Call: Rick Utley, (209)825-7063. [Exp. #75.]

ORACLE

San Francisco Oracle User Group. Meetings: 2nd Wed., Various locations. Call: (415)894-4549. [Exp. #73.]

PARADOX

San Francisco Paradox User Group: BAPALS. Meetings: 4th Tues., 4:00 pm, SF State Downtown Center, 814 Mission St., Suite 206. Call: Brad Jung, (415)287-5833. [Exp. #75.]

PROGRAMMING LANGUAGES

Basic SIG/SFPCUG. Meetings: 6:30 pm, UCSF, 3333 California St., San Francisco. Call: (415)952-3450. [Exp. #77.]

Fourth Interest Group Of North Bay. Meetings: 3rd Sat., 1-5 pm, 2055 Center St., Berkeley. Tutorial at noon. Call: Leonard Morgenstern, (415)376-5241. [Exp. #73.]

Smalltalk/V User Group. Meetings: Last Thurs., 6:30 pm. Call: David Freihofner, (415)362-4283. [Exp. #75.]

Smalltalk/V SBUG (South Bay User Group). Meeting: 2nd Thurs., 7:00 pm. Call: Dave O'Neal, (408)929-1969.

R:BASE

East Bay R:Base User Group. Meetings: 4th Thurs., 8:30 am, Call: David, (415)548-4927. [Exp. #75.]

Peninsula R:Base User Group (PR:BUG). Meetings: 2 Meadowsweet Lane, San Carlos. Call: (415)592-5033. [Exp. #73.]

SQL

SQL Server User Group. New, call for information. Call: Patty Sellers at Marathon Systems, (415)362-0500. [Exp. #75.]

TEXAS INSTRUMENTS

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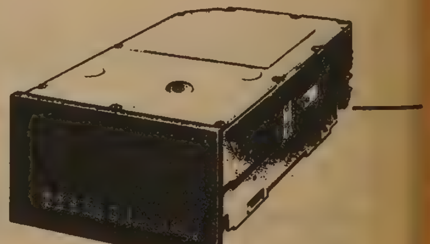

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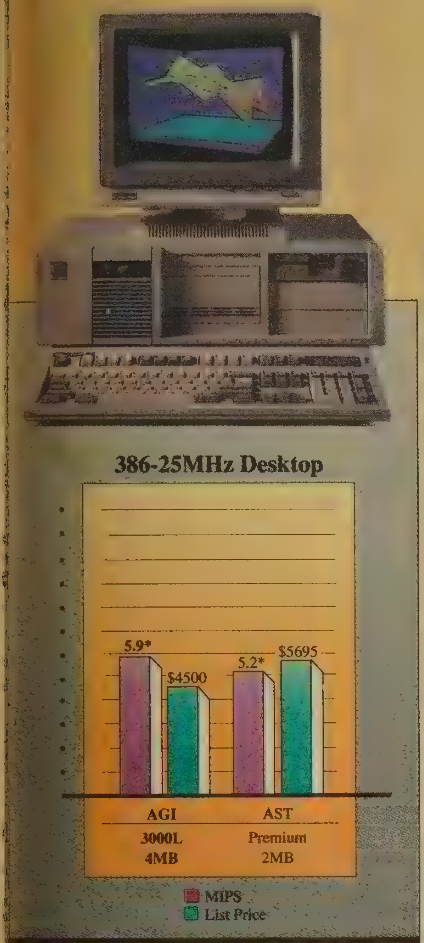

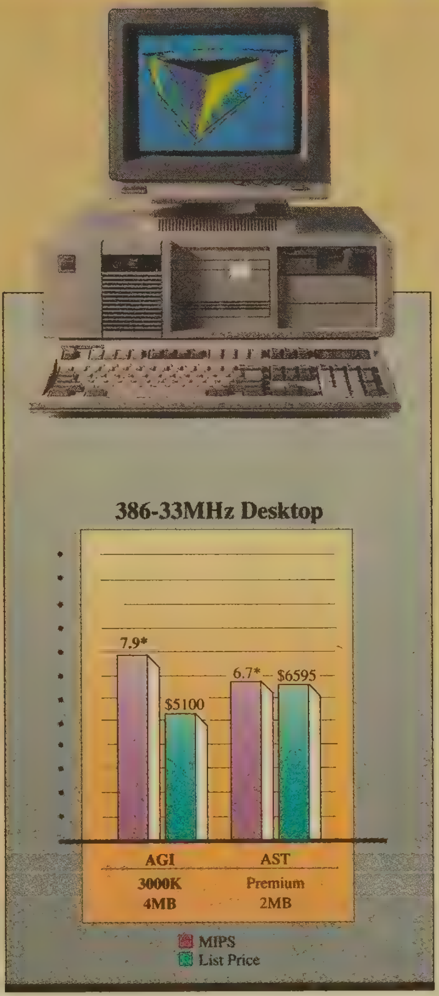

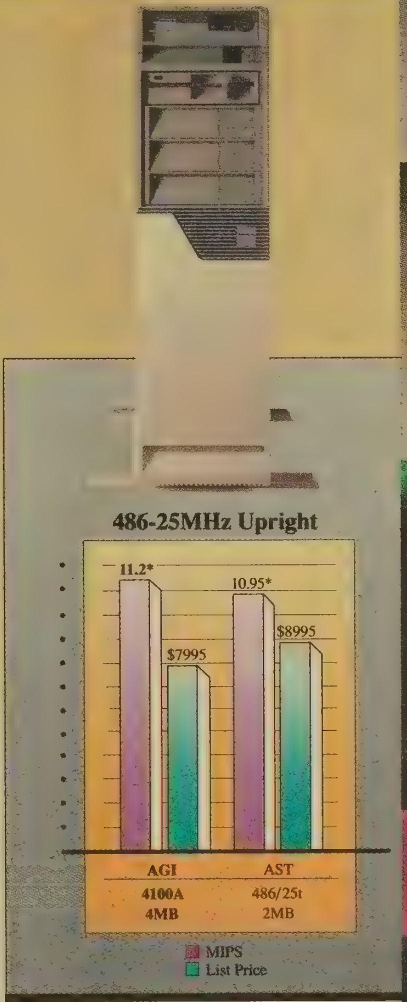

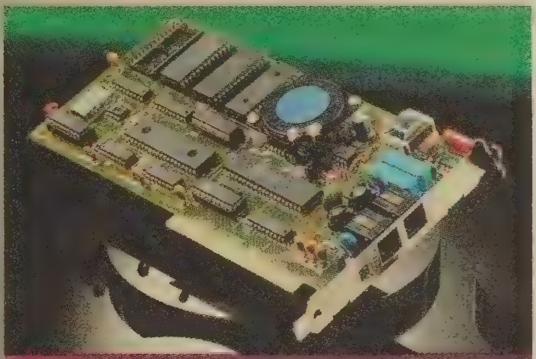

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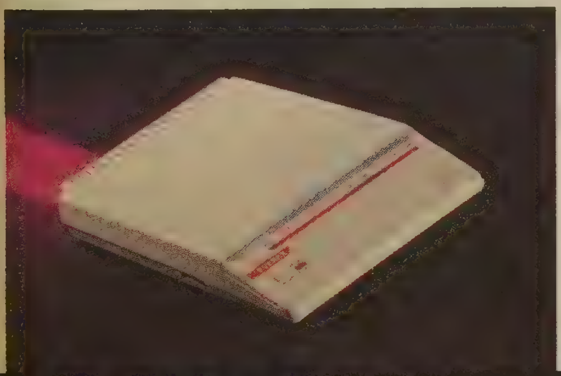

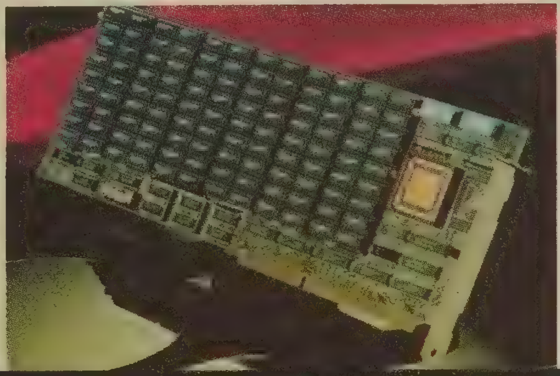

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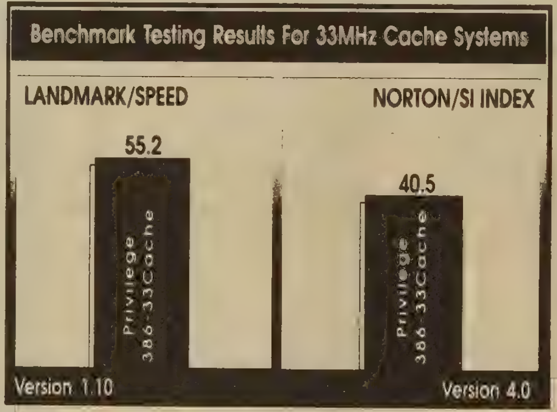

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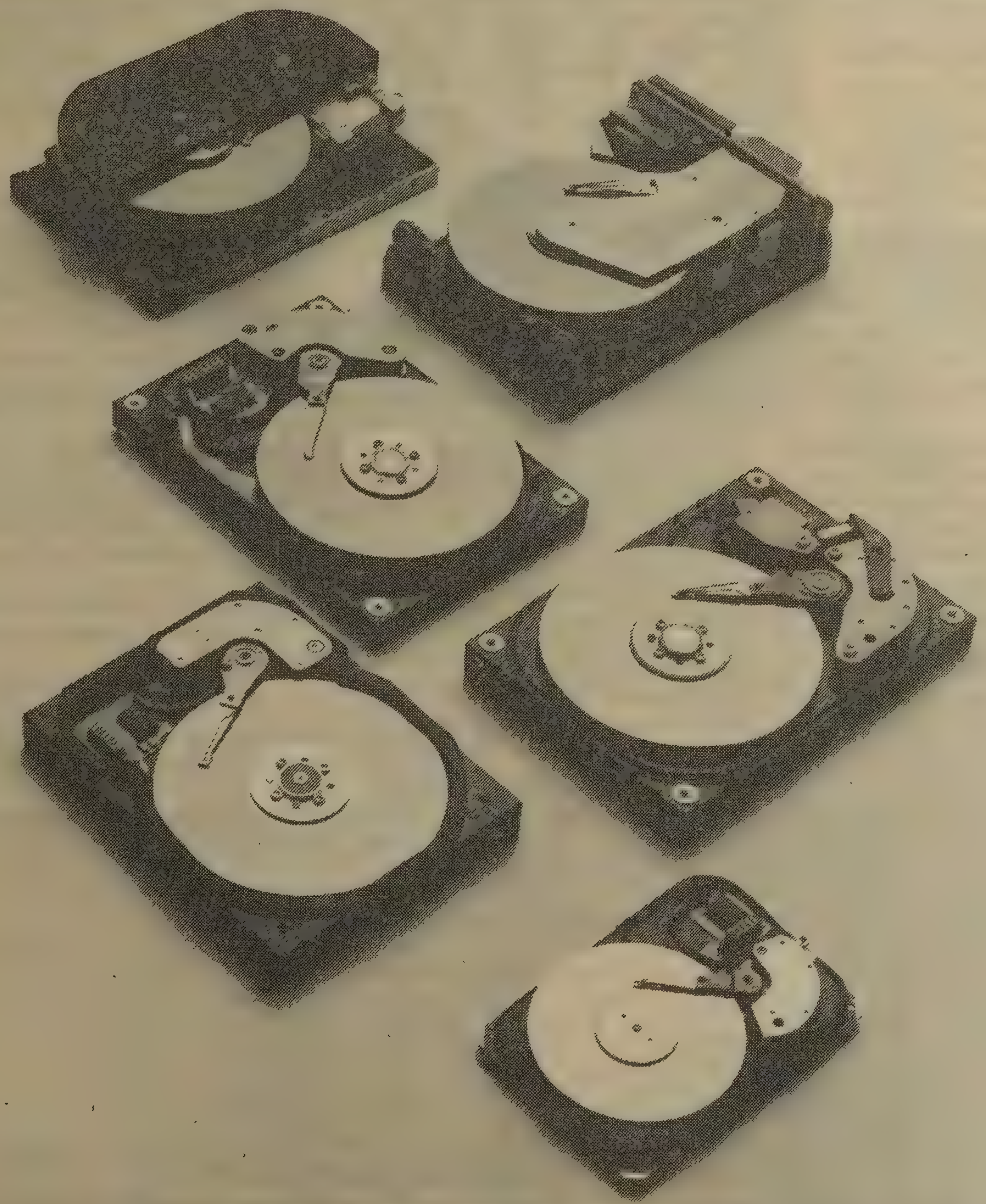

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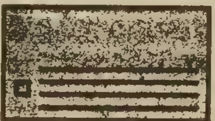

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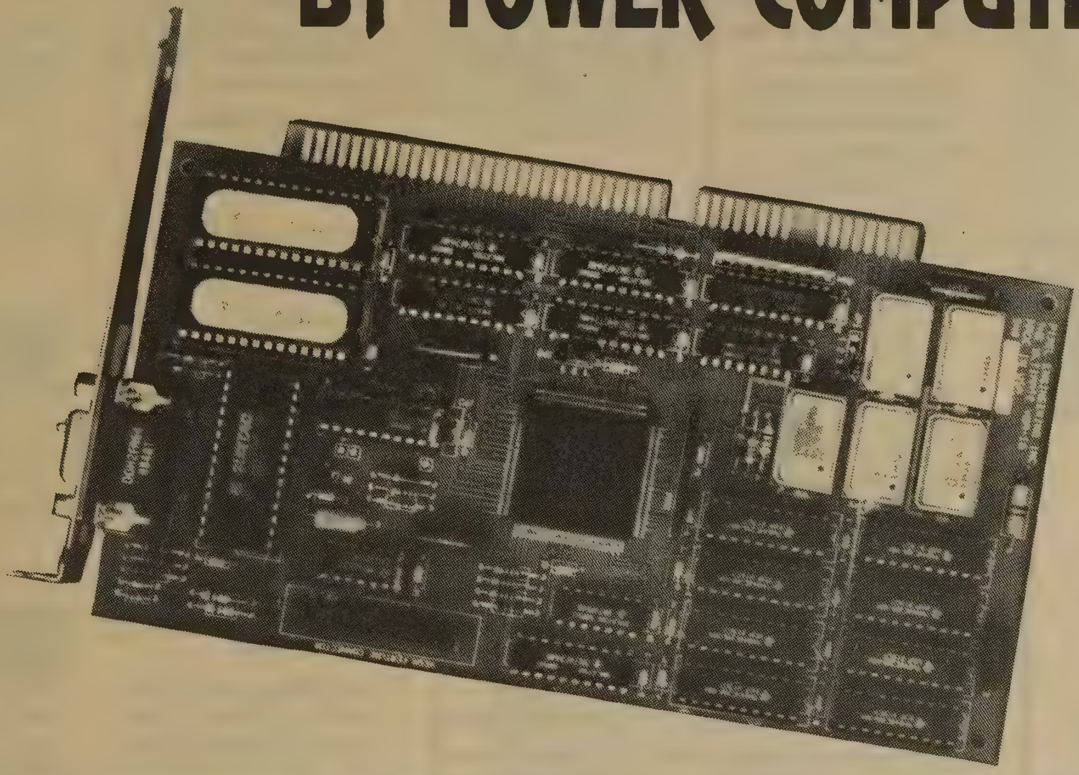

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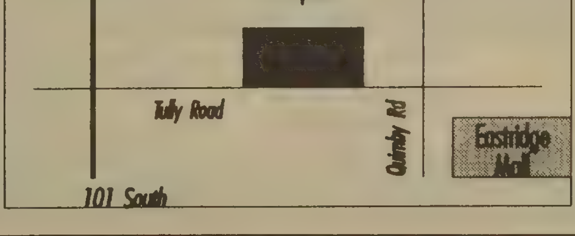

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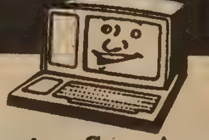

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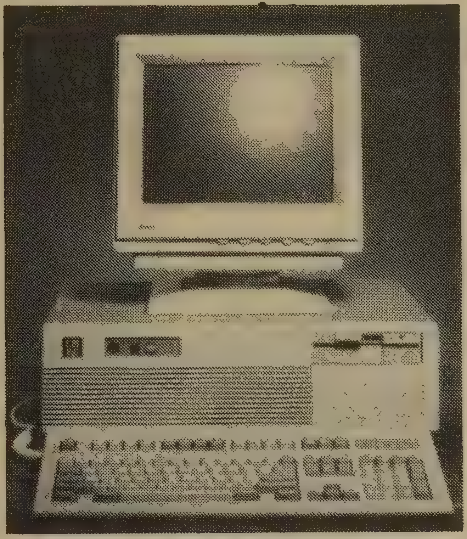

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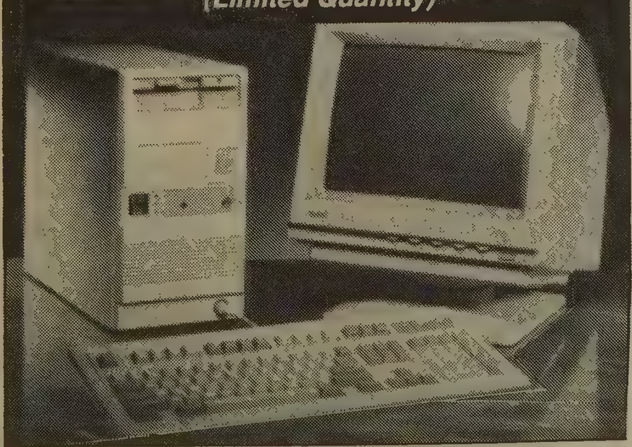

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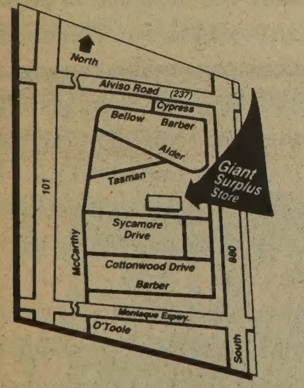

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After Crushing The Paperback Software Menace For The World Spreadsheet Championship, Lotus Now Takes On Borland

BY JOHN C. DVORAK

DVORAK'S LAST COLUMN

If there's big news in the industry, it's over the results of the Lotus vs. Paperback Software lawsuit. "Look and feel" is the issue.

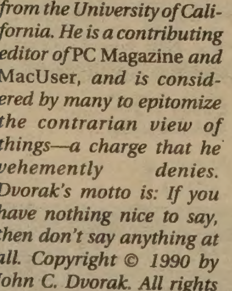
Lotus won the suit, claiming that Paperback's VP-Planner, an outstanding clone, was too outstanding. In fact, it was hard to distinguish it from the real thing, 1-2-3. Now a product that is clearly superior to Lotus, Borland's Quattro Pro, is under attack. Sued by Lotus. Everyone is mad at Manzi and Lotus for pursuing Borland, but who can blame them if the legal system goes along with the program? We live in a litigious society, after all. Manzi would be remiss if he didn't pursue this to the logical end.

Hopefully, in the Borland situation a better precedent will be established, and the concept of "fair use" (used by the print media so often to legally quote and cite copyrighted material) will be introduced into the software scene.

FAIR USE FOR SOFTWARE?

Fair use means you can take a small portion of someone else's material and incorporate it into your own material. Usually this requires giving credit to the originator. If Borland uses a non-Lotus front-end, but makes available a Lotus-compatible command set and gives credit to Lotus, then fair use should apply. In the case of Paperback Software, the Lotus front-end was a permanent part of the interface, with no such credit given.

After all, it's only the command set that we're talking about. The underlying code and everything else about the two products is different. Furthermore, with Quattro, the command set is an option and fair use credit is given. It's important to the industry and the future of computing that the courts see it this way; otherwise no two software packages will ever be nearly the same and there will be no such thing as a standard. The idea of improving an idea and progressing towards some brighter future will be dimmed forever if Lotus wins the case against Borland. The future might also be bleak if Borland wins for the wrong reasons. The Fair Use concept has to be applied to software once and for all.



John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all. Copyright © 1990 by John C. Dvorak. All rights reserved.*

If I were Bill Gates at Microsoft I'd give Philippe Kahn at Borland a call and say, "How much money and help do you need to win this case?" If Borland loses on this issue, Microsoft will surely lose in its role as a defendant fighting Apple over the look and feel of Windows. If all "look and feel" is actionable, then Windows and Presentation Manager are at risk. This is despite the fact that Windows and PM are only partly similar to the Mac interface.

What's important is the direction of legal precedent. This mess all began with Brøderbund suing a small company, Unison World, for making a PC version of its popular Print Shop program. The interface was just like the interface of Print Shop. I thought the case was two-bit, hokey. The decision was based on an old precedent established by Hallmark Greeting cards concerning the look and feel of a greeting card. The Brøderbund lawyers had simply outflanked the Unison World attorneys and convinced the court that the product was a rip-off, even if it wasn't even running on the same machines and didn't incorporate the same code. It had a similar "look and feel," that was all.

A few months after that case was settled in 1987, the Lotus suit was filed. I'm sure that the world would be a better place had Brøderbund not won that case. The Borland case may be the last chance to turn the courts around.

Personally, and I've written about this before, I think both the patent laws and the copyright laws are far too restrictive. Patent laws are designed for a slow-moving pre-industrial revolution society and now do little more than hamper progress. This fact is becoming increasingly more apparent as the patent-happy Japanese attempt to patent everything from dropping a hammer on your foot from ten feet to dropping a hammer on your foot from two feet and everything in-between. Soon everyone is in court.

Watching the machinations between Hitachi and Motorola, for example, over their various semiconductor patents is sickening. Who benefits from all this? Motorola? Hitachi? The public? The court system? Try this answer: nobody. Even the attorneys would rather find other things to do.

The Motorola-Hitachi suits (which, if you don't know, have almost resulted in the ceased production of the Motorola 68030, a key chip in the newest Apple Macintoshes) are the future. It's going to get worse and worse. Furthermore, the complexity of such cases cannot be handled by any court system in the world. It's ridiculous. If World War III is going to break out, it will be over a patent violation.

A good way to begin to clear up this mess is to reduce the patent life to five years. In today's fast-paced society we can't afford to wait forever for important technologies to be released into the public domain. Besides that, litigation will have a race against time and be made more efficient in the process.

The copyright laws, too, are a mess. The fact that John Fogerty got sued by Fantasy Records for just being himself shows how ludicrous the copyright laws are. Paul McCartney has to pay royalties to Michael Jackson to sing McCartney-composed songs. It's ridiculous. Intellectual property cannot be magically transformed into real property by an act of Congress. What you end up with is an abomination. By making every three words, however and wherever used, copyrightable and "property," you create an unreasonable mess.

Copyright laws were designed to protect the publishing industry from open bootlegging. They weren't designed to keep people from singing their own songs, or to keep writers from repeating themselves. Above all, copyright laws were not designed to protect the order of characters that appear on an 80 x 24 screen. This notion, and all related computer-oriented notions concerning copyright, have been afterthoughts—court interpretations. It's a kludge. What we need is some new form of protection—not copyright nor patent—specifically designed for software. It should protect ONLY the underlying source code from blatant rip-offs. That's what everyone in the business says should be protected. That's what everyone has always said should be protected.

Of course, now that the courts have altered the course of history by equating Hallmark Greeting Cards with computer software, all hell will break loose. The big loser: progress. For now, a liberalized Fair Use concept would suffice. ■

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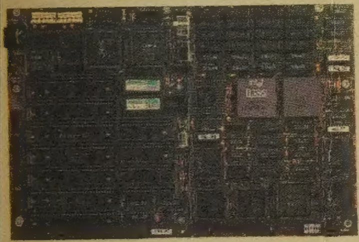

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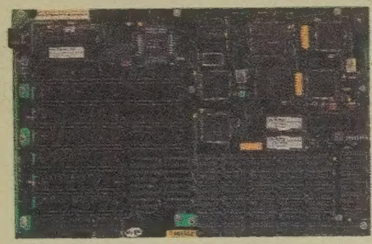

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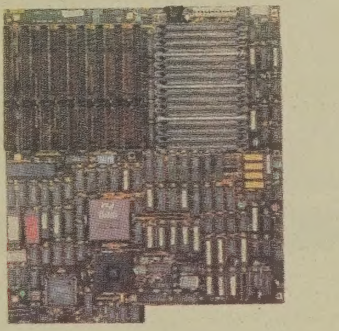

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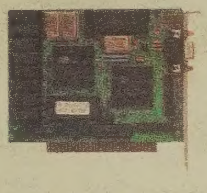

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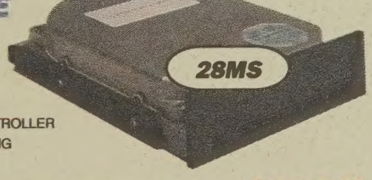

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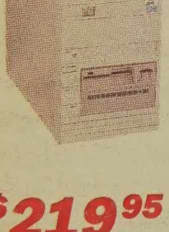

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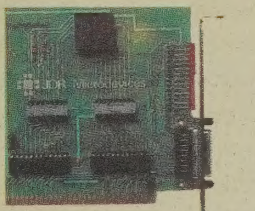

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Every day I have people call or come in to the store with questions about a hardware problem or software bug they are encountering. There are as many different questions as there are system configurations!

That is why I have decided to cover Software and Hardware Diagnostics at our August 25th Technical Learning Center presentation. We are bringing in a few expert technicians to help answer your questions, and to introduce some tools that can make your task easier.

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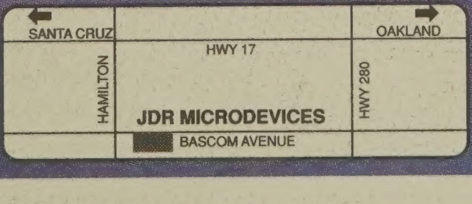

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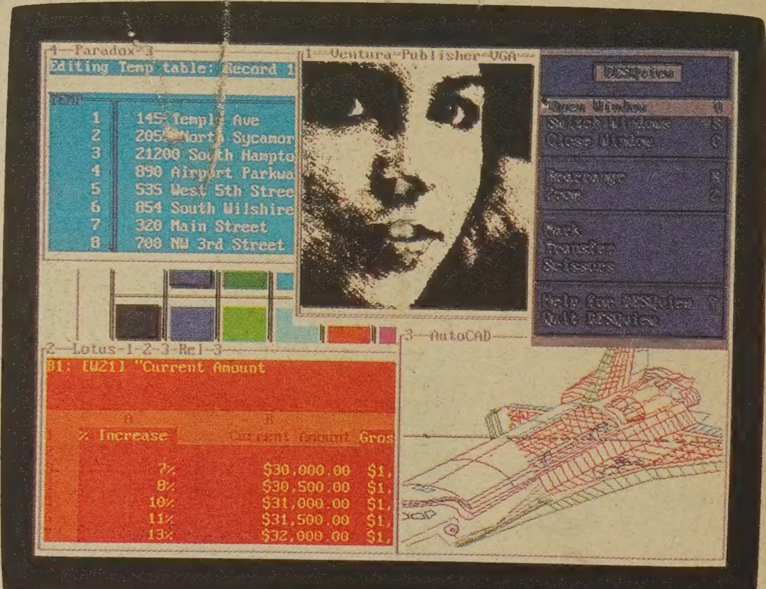

```
4—Paradox 3
Editing Temp table: Record 1
     1   145 Temple Ave
     2   205 North Sycamor
     3   21200 South Hampto
     4   890 Airport Parkwa
     5   535 West 5th Stree
     6   854 South Wilshire
     7   320 Main Street
     8   700 NW 3rd Street

1—Ventura-Publisher-VGA

2—Lotus-1-2-3-Rel-3
B1: [W21] "Current Amount
      A                B
 % Increase      Current Amount  Gros
        7%       $30,000.00   $1,
        8%       $30,500.00   $1,
       10%       $31,000.00   $1,
       11%       $31,500.00   $1,
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3—AutoCAD
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